

ZASTUPLJENOST KRITERIJUMA KOJI DEFINIŠU NIVO RAZVOJA OSNOVNE MOTORNE VEŠTINE BACANJE LOPTICE IZNAD RAMENA SA ANALITIČKIM PRISTUPOM

CRITERIA REPRESENTATION WHICH DEFINED DEVELOPMENT LEVEL OF FUNDAMENTAL MOVEMENT SKILL OVERARM THROWING WITH ANALYTICAL APPROACH

Aleksandar Aceski¹, Ilija Klinčarov¹, Nikola Stojanović², and Toplica Stojanović³

¹Fakultet fizičke kulture, Univerzitet "Ćiril i Metodije", Skoplje, Republika Makedonija
Faculty of physical culture, University "Cyril and Methodius", Skopje, FYR Macedonia

²Fakultet sporta i fizičkog vaspitanja, Univerzitet Niš, Srbija
Faculty of Sport and Physical Education, University of Niš, Serbia

³Fakultet fizičkog vaspitanja i sporta, Univerzitet Banja Luka, Bosna i Hercegovina
Faculty of Physical Education and Sport, University of Banja Luka, Bosnia and Herzegovina

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Summary

Fundamental movement skills are the building blocks for successful participation in games and sports. Overarm ball throwing belongs to the fundamental motor skill group which is of manipulative type and is present in all physical education curriculums around the world. The aim of this research was to determine the criteria representation which defines the development level of the fundamental motor skill of overarm throwing with analytical approach.

A total of 460 boys were analyzed. They were 3-10 years old, from Skopje. For each group of boys was determined average percentage of each development level, which defines development level of overarm throwing.

The results of our research show that the lowest percentage of representation of the highest levels of development and, therefore the most difficult to perform, is trunk rotation 2.32%. The highest percentage 18.62% was established in foot motion which is the easiest to perform.

Key Words: overarm throwing, development level, analytical approach, percentage.

Introduction

Regular participation in the physical activities is the basis for children's regular growth and development, as well as for improvement and for keeping health on higher level in different development phases.

Fundamental motor skills are the foundation movements or precursor patterns to more specialized, complex skills in games, sports, dance, aquatics, gymnastics and recreational activities (Health & Physical Education, 2006).

Sažetak

Fundamentalne motorne veštine predstavljaju gradivne blokove koji su neophodni za uspešno participiranje u sportu i igrama. Bacanje loptice iznad ramena pripada grupi osnovnih motornih veština manipulativnog tipa koja je prisutna u svim kurikulumima fizičkog obrazovanja u celom svetu. Cilj istraživanja je bio utvrditi procentualnu zastupljenost kriterijuma koji definišu nivo razvoja ove veštine sa analitičkom pristupom.

Ukupno je analizirano 460 ispitanika muškog pola uzrasta od 3 do 10 godina. Za svaku grupu određena je prosečna procentualna zastupljenost nivoa razvoja, koji definišu sam motorni razvoj ove veštine.

Rezultati istraživanja pokazuju da najmanju procentulanu zastupljenost kod najviših nivoa razvoja, a zapravo i najteže za manifestaciju, je ona koje definiše rotacija trupa 2,32%. Najveća procentulna zastupljenost kod najviših nivoa, a zapravo i najlakša za manifestaciju, je ona koje definiše kretanje stopala 18,62%.

Ključne reči: bacanje loptice iznad ramena, nivo razvoja, analitički pristup, procenat.

Uvod

Redovno učešće u fizičkim aktivnostima predstavlja osnovu za pravilan rast i razvoj dece, poboljšanje i održavanje zdravlja na višem nivou u različitim fazama razvoja.

Fundamentalne motorne veštine predstavljaju gradivne blokove koji su neophodni za uspešno participiranje u igrama, sportu, plesu, sportovima na vodi, gimnastici i rekreativnim aktivnostima (Health & Physical Education, 2006).

Motor development is sequential, continuous age-related process whereby an individual progresses from simple, unorganized, and unskilled movement to the achievement of highly organized, complex motor skills and finally to the adjustment of skills that accompanies aging (Haywood & Getchell, 2005, 2009).

Monitoring the fundamental motor skills development among other things is the basis for acquiring complete image for children's motor development and its monitoring and evaluation are one of the most important approaches that has to be implemented during the creation of physical education curriculums for small children.

Overarm throwing is part of the fundamental motor skills group of manipulative type that has to be achieved so that other more complex movements of this type may be upgraded that find their application in the physical education, sports and sport recreation. Barton and Miller (1998) stated that with children the fundamental motor skills usually occur in the period from the first to the seventh year of their life. Many authors, on the basis of their researches, defined models that refer to the level of development of different segments that define this skill (Robertson, 1977, 1978, 1984; Robertson & DiRicco, 1981; Robertson & Langendorfer, 1980; Seefeldt et al., 1972). In these models the motor skill is consisted of several segments (components), and in each of them the levels of development are shown. The purpose of this research is to define the average percentage representation of the development levels for this motor skill through the analytical approach, as well as to define the levels that are the most difficult and the easiest for manifestation for these groups of subjects.

Methods

Entity sample

Total of 460 children were analyzed between the age of 3 and 10 from four kinder gardens and from four primary schools from Skopje. The number of children at the age of 3 is 30, at the age of 4 is 61, at 5 is 81, at 6 is 53, at 7 is 59, at 8 is 71, at 9 is 54 and at the age of 10 the number is 51.

Variables

In this research the overarm ball throwing test is applied.

Procedures

After the child worms up with body shape exercises, he has to perform three consecutive overarm throws. For the children between the age of 3 and 6, the ball was made out of a sponge and it was smaller and lighter. The children between the age of 7 and 10 threw a tennis ball. For more clear and correct movement evaluation, each movement was simultaneously recorded with the Sony HC-19 camera in two planes and 1380 manifestations were analyzed. Then, the Dartfish Connect 4.5 software for biomechanical movement analysis was used which consists of various tools that allow more precise analysis (slowed down movement, zooming etc.) in order to more successful assess the level for each manifestation separately.

Statistical analysis

With the application of the SPSS 15 program, the average percentage representation of the development levels for each group has been defined. On this basis the most difficult

Motorni razvoj je podređeni, uzrasno usmeren proces u kome individua napreduje od jednostavnog, neorganizovanog i neveštog kretanja do izvedbe visoko organizovane kompleksne motorne veštine koja će trajati tokom života (Haywood & Getchell, 2005, 2009).

Praćenje razvoja osnovnih motornih veština između ostalog predstavlja i osnovu za sticanje kompletne slike celokupnog motornog razvoja deteta, a njihovo praćenje i procena su jedna od najvažnijih pristupa koji mora da bude implementiran pri kreiranju kurikuluma fizičkog i zdravstvenog vaspitanja dece od najmanjeg uzrasta.

Bacanje loptice iznad ramena spada u grupu osnovnih motornih veština manipulativnog tipa, koju je neophodno savladati sa ciljem da se mogu uspešno nadograditi druga složenija kretanja ovog tipa, koja nalaze primenu u fizičkom vaspitanju, sportu i sportskoj rekreaciji. Barton i Miller (1998) navode da se osnovne motorne veštine kod dece uobičajeno pojavljuju u periodu od 1 do 7 godine života.

Mnogi autori su na osnovu svojih istraživanja utvrdili modele koji se odnose na nivo razvoja različitih segmenata koji definišu ovu veštinu (Robertson 1977, 1978, 1984; Robertson & DiRicco 1981; Robertson & Langendorfer 1980; Seefeldt et al., 1972). U ovim modelima motorna veština je sastavljena od više segmenata, a u svakom od njih su prikazani nivoi razvoja.

Cilj istraživanja je da se odredi prosečna procentualna zastupljenost nivoa razvoja u ovoj motornoj veštini sa analitičkim pristupom, kao i da se utvrde oni nivoi koji su najteži i najlakši za manifestaciju kod ovih grupa ispitanika.

Metode

Uzorak ispitanika

Analizirano je ukupno 460 dece uzrasta od 3 do 10 godina iz četiri obdaništa i četiri osnovne škole iz Skoplja. Broj dece 3-godišnjeg uzrasta je 30, 4-godišnjeg 61, 5-godišnjeg 81, 6-godišnjeg 53, 7-godišnjeg 59, 8-godišnjeg 71, 9-godišnjeg 54 i 10-godišnjeg 51.

Varijable

U istraživanju je primenjen test bacanja loptice preko ramena.

Procedure

Nakon zagrevanja deteta vežbama oblikovanja, svako od njih ima zadatak da izvede tri uzastopna bacanja loptice. Loptica za decu od 3 do 6 godina je bila od sunđera i sa manjom masom i obimom. Loptica za decu od 7 do 10 godina je bila teniska. Sa ciljem jasnije i tačnije procene kretanja, svako kretanje je bilo istovremeno snimljeno sa dve video kamere tipa Sony HC-19 u dve ravni, i pritom su analizirane ukupno 1380 manifestacije. Potom je korišten softver za biomehaničku analizu kretanja Dartfish Connect 4.5, koji sadrži najrazličitije alatke koje omogućuju preciznu analizu (usporeni pokret, zumiranje, itd.), a time i određivanje nivoa razvoja svake manifestacije pojedinačno.

Statistička analiza

Primenom statističkog programa SPSS 15, za svaku grupu pojedinačno je utvrđena prosečna procentualna zastupljenost

and the easiest levels of manifestation are also defined. The highest development level with the lowest percentage representation is defined to be the most difficult for manifestation, and the level with the highest representation as the easiest.

The result from each manifestation is noted in the table where there is the appropriate development level for that particular skill (Table 1)

nivoa razvoja. Na osnovu toga su utvrđeni najteži i najlakši nivoi manifestacija. Najviši nivo razvoja koji ima najmanju procentualnu zastupljenost je utvrđena kao najteža za manifestaciju, a ona sa najvećom zastupljenošću za najlakšu.

Rezultat svake manifestacije je upisan u tabelu gde se nalazi odgovarajući nivo razvoja te veštine (Tabela 1).

Table 1: Development levels for the overarm throwing fundamental motor skill

LEVEL	SEGMENT (Component)
Foot action component in forceful throwing and striking	
1	No step. The child throws from the initial foot position.
2	Homolateral step. The child steps with the foot on the same side as the throwing hand.
3	Short contralateral step. The child steps with the foot on the opposite side of the throwing hand.
4	Long contralateral step. The child steps with the opposite foot a distance of over half the child's standing height.
Trunk action in throwing and striking for force	
1	No trunk action or forward-backward movements. Only the arm is active in force production. Sometimes the forward thrust of the arm pulls the trunk into a passive left rotation (assuming a right-handed throw), but no twist-up precedes that action. If trunk action occurs, it accompanies the forward thrust of the arm by flexing forward at the hips. Preparatory extension sometimes precedes forward hip flexion.
2	Upper trunk rotation or total trunk blocks rotation. The spine and pelvis rotate away from the intended line of flight and then simultaneously begin forward rotation, act as a unit, or block. Occasionally, only the upper spine twists away, then toward the direction of force. The pelvis, then, remains fixed, facing the line of flight, or joins the rotatory movement after forward spinal rotation has begun.
3	Differentiated rotation. The pelvis precedes the upper spine in initiating forward rotation. The child twists away from the intended line of ball flight and then begins forward rotation with the pelvis while the upper spine is still twisting away.
Backswing, humerus, and forearm action in the overarm throw for force	
Preparatory arm backswing component	
1	No backswing. The ball in the hand moves directly forward to release from the arm's original position when the hand first grasped the ball.
2	Elbow and humerus flexion. The ball moves away from the intended line of flight to a position behind or alongside the head by upward flexion of the humerus and concomitant elbow flexion.
3	Circular, upward backswing. The ball moves away from the intended line of flight to a position behind the head via a circular overhead movement with elbow extended, or an oblique swing back, or a vertical lift from the hip.
4	Circular, downward backswing. The ball moves away from the intended line of flight to a position behind the head via a circular down-and-back motion, which carries the hand below the waist.
Humerus (upper arm) action component during forward swing	
1	Humerus oblique. The upper arm moves forward to ball release in a plane that intersect the trunk obliquely above or below the horizontal line of the shoulders. Occasionally, during the backswing, the upper arm is placed at a right angle to the trunk, with the elbow pointing toward the target. It maintains this fixed position during the throw.
2	Humerus aligned but independent. The upper arm moves forward to ball release in a plane horizontally aligned with the shoulder, forming a right angle between humerus and trunk. By the time the shoulders (upper spine) reach front-facing, the upper arm and elbow have moved independently ahead of the outline of the body via horizontal adduction at the shoulder.
3	Humerus lags. The upper arm moves forward to ball release horizontally aligned, but at the moment the shoulders (upper spine) reach front-facing, the upper arm remains within the outline of the body. No horizontal adduction of the upper arm occurs before front-facing.
Forearm action component during forward swing	
1	No forearm lag. The forearm and ball move steadily forward to ball release throughout the throwing action.
2	Forearm lag. The forearm and ball appear to lag (i.e. to remain stationary behind the child or to move downward or backward in relation to the child). The lagging forearm reaches its farthest point back, deepest point down, or last stationary point before the shoulder (upper spine) reach front-facing.
3	Delayed forearm lag. The lagging forearm delay reaching its final point of lag until the moment of front-facing.

Table 1: Nivo razvoja kod osnovne motorne veštine bacanje loptice preko ramena

NIVO	SEGMENT
Komponenta akcije stopala u silovitom bacanju i udaranju	
1	Bez koračanja. Dete baca iz početne pozicije stopala.
2	Homolateralni korak. Dete iskoračuje istostranom nogom u odnosu na ruku kojom baca.
3	Kratak kolateralni korak. Dete iskoračuje suprotnom nogom u odnosu na ruku kojom baca.
4	Dugi kolateralni korak. Dete iskoračuje suprotnom nogom na udaljenosti većom od polovine stojeće visine.
Akcija trupom pri snažnom bacanju i udaranju	
1	Bez akcije trupa ili pokreta napred-nazad. Samo je ruka aktivna u produkciji snage. Ponekad potisak ruke napred vuče trup u pasivnu levu rotaciju (pod pretpostavkom da je bacač dešnjak), ali ako zaokret ne prethodi akciji. Ako se pojavljuje pokret trupom, onda potisak ruku napred prati opuštanje napred do visine kukova.
2	Rotacija gornjeg dela trupa ili potpuna blokada rotacije trupa. Kičma i karlica rotiraju dalje od predviđene linije a onda počinje simultani početak rotacije napred, realizovan kao pojedinačni ili kao blok pokreta. Povremeno, samo gornji deo kičme se okreće, a zatim ide u pravcu sile. Karlica onda, fiksirana, prati liniju leta, ili ulazi u rotaciono kretanje nakon što počne spinalna rotacija napred.
3	Diferencirane rotacije. Karlica prethodi inicijaciji pokreta rotacije napred gornjeg dela kičme. Dete zaokreće od nameravane linije leta lopte, i onda počinje rotaciju napred karlicom, dok gornji deo kičme još uvek rotira udaljeno.
Zamah nazad, nadlaktak, i akcija podlaktice u snažnom bacanju preko ramena. Pripremna komponenta zamaha rukom nazad	
1	Bez zamaha nazad. Loptica se u ruci kreće direktno napred dok ne napusti pravu poziciju ruke koju je imala pri prihvatanju.
2	Fleksija lakta i nadlaktice. Loptica se kreće udaljeno od nameravane putanje leta u poziciji iza ili uz glavu pri gornjoj fleksiji nadlaktaka i istovremene fleksije lakta.
3	Kružni, gornji zamah nazad. Loptica se kreće udaljeno od nameravane putanje leta u poziciji iza glave preko cirkularnog pokreta opružanja lakta iznad ramena, ili kosim zamahom nazad, ili vertikalnim podizanjem iz kuka.
4	Cirkularni zamah nazad nadole. Loptica se kreće udaljeno od nameravane putanje leta u poziciji iza glave preko cirkularnog pokreta dole i nazad, koji povlači ruku ispod struka.
Komponenta akcije nadlaktice tokom zamaha napred	
1	Kosa nadlaktica. Nadlaktica se kreće napred za izbacivanje loptice u ravni koje seku trup koso iznad ili ispod horizontalne linije ramena. Occasionally, tokom zamaha nazad, nadlaktica je pozicionirana pod pravim uglom u odnosu na trup, sa laktom okrenutim ka meti. Ona zadržava istu poziciju tokom bacanja.
2	Nadlaktica poravnata, ali nezavisna. Nadlaktica se kreće napred za izbacivanje loptice u ravni horizontalnoj sa ramenima, formirajući prav ugao između nadlaktaka i trupa. Istovremeno kad su ramena (gornji deo kičme) usmerena napred, nadlaktica i lakat se nezavisno pomeraju ispred linije tela preko horizontalne addukcije u ramenu.
3	Nadlaktak zaostaje. Nadlaktica se kreće napred za izbacivanje loptice horizontalno poravnata, ali u momentu kad su ramena (gornji deo kičme) usmerena napred, nadlaktica zaostaje u liniji tela. Nema horizontalne addukcije nadlaktice pre usmeravanja napred.
Komponenta akcije podlaktice tokom zamaha napred	
1	Bez zaostajanja podlaktice. Podlaktica i loptica se kreću polako napred do otpuštanja loptice tokom akcije bacanja.
2	Zaostajanje podlaktice. Podlaktica i loptica zaostaju (tj. da ostanu nepokretni iza deteta ili da se kreću nadole i nazad u odnosu na dete). Zaostajanje podlaktice dostiže najdalju tačku nazad, najdublju tačku nadole, ili zadnju stacioniranu tačku pre usmeravanja ramena (gornjeg dela kičme) napred.
3	Odloženo zaostajanje podlaktice. Zaostajanje podlaktice se odlaže do finalne tačke zaostajanja pre momenta usmeravanja napred.

Results

In Table 2 the average percentage representation of the development level for this skill is shown, for each segment from the initial level 1 to the most advanced level 3 i.e. 4 depending on the number of levels that define that segment.

Rezultati

U Tabeli 2 prikazana je prosečna procentualna zastupljenost nivoa razvoja kod ove veštine, za svaki segment od početnog nivoa 1, pa sve do najnaprednijeg nivoa 3, odnosno 4, u zavisnosti od broja nivoa koji definišu taj segment.

Tabela 2: *Prosečna procentualna zastupljenost nivoa razvoja kod ispitanika od 3 do 10 godina*
Table 2: *Average percentage representation of the development levels for subjects between the age of 3 and 10*

Component	Foot			Trunk										Arm																				
				Backswing			Upper arm			Forearm						Upper arm			Forearm															
	1	2	3	4	1	2	3	1	2	3	4	1	2	3	1	2	3	4	1	2	3													
Development t-level	60.00 (54)	36.67 (33)	3.33 (3)	0	73.33 (66)	26.67 (24)	0	80.00 (72)	20.00 (18)	0	100.00 (90)	0	86.67 (78)	13.33 (12)	0	69.40 (23.5)	23.50 (43)	7.10 (13)	0	45.90 (84)	54.10 (99)	0	1.64 (3)	62.84 (115)	34.43 (63)	1.09 (2)	97.81 (179)	2.19 (4)	0	59.12 (64)	40.88 (65)	0		
Percentage (repetitions) 3 years	60.00 (54)	36.67 (33)	3.33 (3)	0	73.33 (66)	26.67 (24)	0	80.00 (72)	20.00 (18)	0	100.00 (90)	0	86.67 (78)	13.33 (12)	0	69.40 (23.5)	23.50 (43)	7.10 (13)	0	45.90 (84)	54.10 (99)	0	1.64 (3)	62.84 (115)	34.43 (63)	1.09 (2)	97.81 (179)	2.19 (4)	0	59.12 (64)	40.88 (65)	0		
Percentage (repetitions) 4 years	69.40 (23.5)	23.50 (43)	7.10 (13)	0	45.90 (84)	54.10 (99)	0	1.64 (3)	62.84 (115)	34.43 (63)	1.09 (2)	97.81 (179)	2.19 (4)	0	59.12 (64)	40.88 (65)	0	49.69 (79)	21.38 (34)	20.75 (33)	8.18 (13)	32.08 (51)	67.92 (108)	0	1.89 (3)	47.80 (76)	48.43 (77)	1.89 (3)	98.74 (157)	1.26 (2)	0	59.12 (64)	40.88 (65)	0
Percentage (repetitions) 5 years	49.69 (79)	21.38 (34)	20.75 (33)	8.18 (13)	32.08 (51)	67.92 (108)	0	1.89 (3)	47.80 (76)	48.43 (77)	1.89 (3)	98.74 (157)	1.26 (2)	0	59.12 (64)	40.88 (65)	0	37.45 (71)	23.87 (58)	30.45 (74)	8.23 (20)	16.46 (40)	82.30 (200)	1.23 (3)	0	39.51 (96)	58.20 (141)	2.47 (6)	98.35 (239)	1.65 (4)	0	35.39 (86)	63.38 (154)	1.23 (3)
Percentage (repetitions) 6 years	37.45 (71)	23.87 (58)	30.45 (74)	8.23 (20)	16.46 (40)	82.30 (200)	1.23 (3)	0	39.51 (96)	58.20 (141)	2.47 (6)	98.35 (239)	1.65 (4)	0	35.39 (86)	63.38 (154)	1.23 (3)	30.52 (54)	18.64 (33)	42.37 (75)	8.47 (15)	11.30 (20)	88.14 (156)	.56 (1)	0	19.21 (34)	70.06 (124)	10.73 (19)	93.79 (166)	4.52 (8)	1.69 (3)	16.95 (13)	77.40 (137)	5.65 (10)
Percentage (repetitions) 7 years	30.52 (54)	18.64 (33)	42.37 (75)	8.47 (15)	11.30 (20)	88.14 (156)	.56 (1)	0	19.21 (34)	70.06 (124)	10.73 (19)	93.79 (166)	4.52 (8)	1.69 (3)	16.95 (13)	77.40 (137)	5.65 (10)	10.33 (22)	10.80 (23)	53.05 (113)	25.82 (55)	4.69 (10)	92.96 (198)	2.35 (5)	0	7.98 (17)	72.77 (155)	19.25 (41)	92.48 (197)	3.29 (7)	4.23 (9)	21.60 (46)	62.92 (134)	15.49 (33)
Percentage (repetitions) 8 years	10.33 (22)	10.80 (23)	53.05 (113)	25.82 (55)	4.69 (10)	92.96 (198)	2.35 (5)	0	7.98 (17)	72.77 (155)	19.25 (41)	92.48 (197)	3.29 (7)	4.23 (9)	21.60 (46)	62.92 (134)	15.49 (33)	6.17 (10)	11.73 (19)	38.89 (63)	43.21 (70)	1.85 (3)	91.98 (149)	6.17 (10)	0	1.23 (2)	67.90 (110)	30.86 (50)	82.10 (133)	4.95 (8)	12.16 (21)	9.88 (16)	58.64 (95)	31.48 (51)
Percentage (repetitions) 9 years	6.17 (10)	11.73 (19)	38.89 (63)	43.21 (70)	1.85 (3)	91.98 (149)	6.17 (10)	0	1.23 (2)	67.90 (110)	30.86 (50)	82.10 (133)	4.95 (8)	12.16 (21)	9.88 (16)	58.64 (95)	31.48 (51)	1.96 (3)	4.58 (7)	38.56 (59)	54.90 (84)	0	92.81 (142)	7.19 (11)	0	1.96 (3)	56.21 (86)	41.83 (64)	80.40 (123)	6.53 (10)	13.07 (20)	6.54 (10)	62.09 (95)	32.67 (50)
Percentage (repetitions) 10 years	1.96 (3)	4.58 (7)	38.56 (59)	54.90 (84)	0	92.81 (142)	7.19 (11)	0	1.96 (3)	56.21 (86)	41.83 (64)	80.40 (123)	6.53 (10)	13.07 (20)	6.54 (10)	62.09 (95)	32.67 (50)																	

Legend/Legenda: Component - Segment; Foot - Noga; Trunk - Trup; Arm - Ruka; Backswing - Zama; Upper arm - Nadlaktica; Forearm - Podlaktica; Development t-level - Razvoj t-nivo; Percentage (repetitions) - Procenat (ponavljanje); 3 yeras - 3 godine; 4 yeras - 4 godine; 5 yeras - 5 godina; 6 yeras - 6 godina; 7 yeras - 7 godina; 8 yeras - 8 godina; 9 yeras - 9 godina; 10 yeras - 10 godina.

Table 3 shows the highest levels of manifestations that are the most difficult for manifestation, on the basis of the average percentage representation for each age group.

U Tabeli 3 su prikazani najviši nivoi manifestacija koje su najteže za manifestaciju, na osnovu prosečne procentualne zastupljenosti za svaki uzrast pojedinačno.

Tabela 3: Najteži nivoi za manifestaciju

Table 3: The most difficult levels of manifestation

Age	Foot	Trunk	Arm		
			Backswing	Upper arm	Forearm
3 years	*	*	*	*	*
4 years	*	*		*	*
5 years		*		*	*
6 years				*	
7 years		*			
8 years		*			
9 years		*			
10 years		*			

Legend/Legenda: Component - Segmenat; Foot - Noga; Trunk - Trup; Arm - Ruka; Backswing - Zamah; Upper arm - Nadlaktica; Forearm - Podlaktica; 3 yeras - 3 godine; 4 yeras - 4 godine; 5 yeras - 5 godina; 6 yeras - 6 godina; 7 yeras - 7 godina; 8 yeras - 8 godina; 9 yeras - 9 godina; 10 yeras - 10 godina.

Table 4 shows the highest levels of manifestations that are the easiest for manifestation, on the basis of the average percentage manifestation for each group separately.

U Tabeli 4 su prikazani najviši nivoi manifestacija koji su najlakši za manifestaciju, na osnovu prosečne procentualne zastupljenosti za svaku grupu posebno.

Tabela 4: Najlakši nivoi za manifestaciju

Table 4: Easiest levels of manifestation

Age	Foot	Trunk	Arm		
			Backswing	Upper arm	Forearm
3 years					
4 years			*		
5 years	*				
6 years	*				
7 years			*		
8 years	*				
9 years	*				
10 years	*				

Legend/Legenda: Component - Segmenat; Foot - Noga; Trunk - Trup; Arm - Ruka; Backswing - Zamah; Upper arm - Nadlaktica; Forearm - Podlaktica; 3 yeras - 3 godine; 4 yeras - 4 godine; 5 yeras - 5 godina; 6 yeras - 6 godina; 7 yeras - 7 godina; 8 yeras - 8 godina; 9 yeras - 9 godina; 10 yeras - 10 godina.

Discussion

Analyzing Table 2 we can see the average percentage representation for all development levels for each segment (component) separately. With the highest development levels in all segment that define this movement skill we notice a monotonous increasing trend in the average percentage representation i.e. every next age has higher percentage representation than the previous one, except with the segment of 7 year old group where there is an evident decrease (.56% i.e. 1 manifestation) but still this is considered to be negligible.

Diskusija

Analizom Tabele 2 se uočava prosečna procentualna zastupljenost svih nivoa razvoja za svaki segment posebno. Kod najviših nivoa razvoja u svim segmentima koji definišu ovu motornu veštinu se uočava monotono rastući trend prosečne procentualne zastupljenosti, odnosno, svaki naredni uzrast ima veću prosečnu procentualnu zastupljenost od prethodne, osim kod segmenta trupa za ispitanike 7-godišnjeg uzrasta, gde se uočava opadanje (0,56% odnosno 1 manifestacija), no ipak se ono može smatrati kao zanemarljivo.

In Table 3, where the symbol * shows the lowest percentage representation for the highest development levels i.e. those levels that are the most difficult for manifestation, we notice that with 3-5 year old subjects there are more segments that are part of that category. With 7, 8, 9 and 10 year old subjects there is a more clear differentiation that the highest level of manifestation that defines the trunk movement is the most difficult for manifestation. With 6 year old subjects this is the humerus movement.

Analyzing Table 4 we notice that within 3 year old subjects there is no highest level of manifestation. The highest percentage representation from the highest development levels i.e. the easiest level of manifestation for 4 and 7 year old children is it the one that defines the backswing. With all remaining groups of subjects the easiest for manifestation is the foot movement.

Variation in motor development within individual children, between children, and from age to age within the same child is considerable during early childhood (Malina, 2004). This can be partly noticed in this research. Analyzing table 3 we can notice that with 3-6 year old children there is a variety of development levels that are the most difficult for manifestation.

The evaluation of the development level as a process for gathering and analyzing information should be part of each physical education curriculum for small children. This approach in evaluation allows determination of the changes that happen in different segments of the body through which this manifestation is defined, and this is important information that should be taken into consideration when the curriculums are created.

Conclusion

The analytical approach (Body Component Approach) is only one of the approaches for evaluation of the development level. From the conducted research we can state that with all body segments that are represented through the highest development levels there is a monotonous increasing trend of the average percentage representation except with the segment body.

Within 3-5 year old children there are more segments (components) that are the most difficult for manifestation while within 6-10 year old children there is only one segment.

The easiest segment for manifestation for the most difficult development levels for 4 and 7 year old subjects is backswing, while for all the others is the foot movement.

This research is only an attempt to evaluate the representation of the development levels for a small group of subjects, but also to stress one of the possible approaches for evaluation, as well as to stress the importance of continuous monitoring of the fundamental movement skills development level in the process of realization of the physical education classes.

The greater generalization requires greater number of subjects, and an application of multivariate statistic methods in order to be defined the relations of separate body segments as well as their connection to the other parts of the anthropological human status.

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U Tabeli 3, gde je zvezdicom označena najniža procentualna zastupljenost najviših nivoa razvoja, odnosno onih nivoa koji su najteži za manifestaciju, a uočava se da su kod ispitanika od 3- do 5-godišnjeg uzrasta prisutni više segmenti koji ulaze u tu kategoriju. Kod ispitanika od 6, 8, 9 i 10 godina se javlja jasnija diferencijacija da je najviši nivo manifestacije koje definiše kretanje trupa najteže za manifestaciju. Kod ispitanika 7-godišnjeg uzrasta to je kretanje naddlaktice.

Analizom Tabele 4 se uočava da kod ispitanika uzrasta 3 godine nema prisustva najviših nivoa manifestacija. Najveća procentualna zastupljenost najviših nivoa razvoja, odnosno najlakših za manifestaciju kod dece od 4 i 7 godina je ona koja definiše zamah rukom. Kod svih ostalih grupa ispitanika najlakše za manifestaciju je kretanje noge.

Varijacije u motornom razvoju pojedine dece, između dece, i od godišta do godišta istog deteta su značajne tokom ranog detinjstva (Malina, 2004). Delimično se to može očititi i u ovom istraživanju. Iz tabele 3 se uočava da se kod dece od 3- do 6-godišnjeg uzrasta javlja jedna šarolikost u nivou razvoja koji su najteži za manifestaciju.

Procenat nivoa razvoja kao produkt sakupljanja i analize informacija treba da bude sastavni deo svakog kurikulumu fizičkog i zdravstvenog vaspitanja kod dece od najmlađeg uzrasta. Ovakav pristup procenjivanju omogućuje da se determinišu promene koje se dešavaju kod različitih segmenata tela, preko kojih se definiše ova manifestacija, a to je važan podatak koji mora da se ima u vidu pri kreiranju kurikulumu.

Zaključak

Analitički pristup (Body Component Approach) je samo jedan od pristupa za procenu nivoa razvoja. Iz sprovedenog istraživanja može da se konstatuje da kod svih segmenata tela koji su predstavljeni preko najviših nivoa razvoja postoji monotono rastući trend prosečne procentualne zastupljenosti, osim kod segmenta trupa.

Kod dece od 3- do 5-godišnjeg uzrasta je prisutno više segmenata koji su najteži za manifestaciju, dok kod dece od 6 do 10 godina se javlja jedan segment.

Najlakši segment za manifestaciju kod najviših nivoa razvoja za ispitanike od 4 i 7 godina je zamah rukom, dok je za sve ostale to kretanje noge.

Ovo istraživanje je samo jedan pokušaj da se na malom broju ispitanika proceni zastupljenost nivoa razvoja, ali i da se potencira jedan od mogućih pristupa za procenu, kao i da se istakne važnost kontinuiranog praćenja nivoa razvoja osnovnih motornih veština u procesu realizacije časa fizičkog i zdravstvenog vaspitanja. Svakako, za neku veću generalizaciju je neophodan veći broj ispitanika i primena multivarijantnih statističkih metoda, sa ciljem utvrđivanja relacija pojedinih segmenata tela, kao i njihova povezanost sa ostalim prostorima antropološkog statusa čoveka.

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