

The effect of 8 weeks combined exercises on dynamic and static balance in low mentally children

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Abstract: The aim of the present study, is the effect of 8 weeks combined exercises on dynamic and static balance in low mentally children in Khorramabad. the research method was Semi-empirical, respectively. The sample included 45 children, boys and girls aged 10 to 12 low mentally from khorramabad with intelligence quotient 58-50 which have participated voluntarily and purposefully in this research plan, and they randomly were divided, into three groups: boy (n = 15) girl (n = 15) and control (n = 15 consists of 7 girls and 8 boys). The research independent variables are, 8 weeks combined workouts (fitness workouts and Central stability exercises) and the dependent variables include static and dynamic balance. Balance measurement using two Y-test (to measure the dynamic balance) and the BESS tests was performed to evaluate static balance. Analyze data with K.S test (to determine the normal being the distribution of the data), dependent t-test, single way Anova and Tukey pursuit test showed that there was no significant difference between and the influences of 8 weeks combined exercises on static balance ($P = 0/17$) and dynamic ($P = 0/94$) boy and girl low mentally children, there was significant effect in Eight weeks combined exercises on static and dynamic balance of little boy low mentally children ($P = 0.0001$).

Key words: Combined exercises, static balance, dynamic balance, exercises of the Central stability

Introduction

Mental retardation syndrome (low mentally) is one of abnormalities of perceptual - transitions of growth period which appear before puberty, and specifically to the children is applied who have deficiency in recognizable task and some adaptive behaviors. Traditionally children with intelligence quotient (I.Q.) less than 70 are clustered in low mentally people. Diagnostic and Statistical Manual of mental disorders (Dastjerdi and Behdad, 1379) and American Association of mental retardation (rafeie.1383). Generally, rear children in learning basis motion skills acquire less scores compared to normal people and they learn these skills more slow than the ordinary people (khalaji and Emad, 1382; Moghimi, et al., 1375). low mental ability, children typically have poor physical status and they donot have man y corporeal freshness. Their quality of walking or removal step is unbalanced and unfirm, and that their overall coordination is weak. Also, careless and deficit accuracy problems of these people, cause disruption in spatial relationships perceptions, finding the right diagnosis, direction (Moghimi, et al., 1375). One of the problems of children, is lack of coordination in performing rhythmic acts. This is due to that the children are not able to understand the timing of successive movements and also in coordinating of limbs movements (coordination of hand and foot, hand and eye, etc.) have a problem balancing, they perform rhythmic acts difficulty and often they cannot perform specific motor pattern that needs setting of precision- speed with their consecutive fingers blows. (Haines, 2006). Based on the

evaluation of the karmeli and colleagues (2008) people with mild low mental due to disorder in integration of sensory and motion information, in perceptual-motion tests perceive less score than ordinary people and their status of balance is more un stable than healthy people (the American Association of mental retardation, 2000). It seems that the weakness of the muscles of central area of body that contain set of back, hips and thighs is caused disruption in the conduct of these activities (Panjabi et al., 1989). The core stability as the motion control and muscle capacity the central area of the body, to maintain the stability of this area in the different posture and the foreign forces and entered on it is known (Panjabi et al., 1989). Investigations have shown that strengthening the muscles of central area of body may be improve the functional ability of body. Increasing the functional ability is caused daily activities is performed better, and in terms of mental health helps individual have more independence in doing its work (Jason, 2003). The antecedent studies have shown the role of central stability on improving performance and function. For example clark and colleagues (2000) the central stability by maintaining direction of suitable physical status during functional activities and to prevent the appearance of the wrong motion patterns is know an important factor to improve the performance and implementation. The effect of various exercises on the balance in the various studies has reported. Hyun chi: (2005) paid to investigation of 8-week tai chi training program on physical preparation and the elderly balance, reported that tai chi training decrease amount of falling in older people

can be Judge and colleagues (2001) reported that strenuous exercises of extremity limbs have effect on the recovery of balance and consequently to reduce the risk of falling elderly women. Study of the effect of central stability on control posture by Petrovski and colleagues (2005) showed that 4 weeks training program of Central stability on the static balance of people has significant effect.

By review the Previous research can founded that, with participating in a suitable program of physical activity, the low mental, children will have the opportunity to physically strengthening and have an active and healthy life when entering into adulthood and it shows the necessity of physical activity and physical education among these people (the parsley et al., 2011). On the other hand low mentally children have low levels of muscle strength, endurance, dexterity, speed running, reaction time and balance with comparison of normal children in their last year together (Panjabi, 1389). To consider the effect of various exercises on the recovery of the balance of these community, can be necessary matter to help these people and prepare them to enter the community question which can be raised in this regard is that can we prepare for these children activities and sensory-motion experiences and combine exercises for normal growth and improving balance status. Some, such as Kofart, Getman, Barsh, Gezel, and Piazhe, believe movement and learning motion is origin of all perceptions and learning and more excellent mental process exist after the growth of perceptions and motion systems and establishing communication between movements and perception. (Wilson et al., 2005). The proper function of human brain is require that is stimulated through the peripheral signals. The importance of these stimulations have well emphasized in researches for growth of motion – sensory on childhood (Kiebler 2006). Therefore, we can say that in the readiness programs which are designed for promoting of motion growth of children, movements training and motion skills, can play stimulating role for the nervous system.

Methodology

This research was semi-empirical. In this study, 45 low mentally girl and boy children (20 girl and 20 boy) were selected after the initial selection. The experiments were base on the IQ scores in the scope of 53 to 73 ($62/10 \pm 5/9$), equated and randomly divided into three groups of 15 boys (with the average age of $10/9 \pm 0/83$; the average height $135/1 \pm 4/8$ centimeter; the average weight $33/2 \pm 5/2$ kg); girls (with the average age of $11/1 \pm 0/88$ year; the average height of $144/6 \pm 9/5$ centimeter; the average weight $40/8 \pm 8/8$ kg) and control (with The average age of $11 \pm 0/84$ year; the average height $138/5 \pm 8/01$ centimeter; The average weight $36/2 \pm 7/9$ kg).

Choice was done between low mental children's training. The classification of Psychiatric

Association of America, low mental children, which have IQ equivalent to 53 to 73 are in mild class or training (barati, 2012). In this study, the arrival criterion to the study was consist of IQ between 53-73 the slope age 10 to 12 years and a lack of genetic, heart, nervous, organic, orthopedic (musculoskeletal),..., postural abnormalities diseases and being multi-dysgenic and as well as some well known medical problems such as Atlanto-Axial Instability, retinal problem, growth hormone deficiency (dwarfism) and Brittle Bone Disease. The exit criterion of study was lack of regular participation and continuous in exercises. All subjects in the first meeting were treated by the physician to ensure the physical health of the subjects, and observance of entry and exit criteria benchmark study of the independent variables in the present research was included of 8 weeks combined workouts (fitness workouts and Central stability exercises), and dependent variables in the present study was included of the size of the static and dynamic balance-related. Dynamic balance was evaluated with BESS test and Static balance was evaluated with Y test.

Static balance; balance error scoring system (BESS): How to run: running performance without shoes. They perform the test in three status on the stable surface (images A-B-C) and three status on the unstable surface (Figure 1), with the closed eyes and hands over the back in the three physical situation includes; standing on two paired feet; standing on the foot of non superior with flexion (bending) 30° in the thigh and 45° in the superior leg knee (picture B); placement in tendon- Two feet behind each other in a line. The heel of the front foot in contact leg with the rear foot claw, (the superior foot in front and non superior foot in rear). Maintains each status 20 seconds. In the event of the occurrence of any one of the following errors when balancing a negative point is recorded: Opening eyes; removing of hands from back; landing foot that was raised of land when standing on one foot; stepping; hopping or every foot motion; removing of claw foot claw; flexion (bending) or abduction (round-up) more than 30° degree in the pelvic (thigh); to stay more than five seconds in a State outside of the standard test condition. The maximum number of errors for each situation is 10. The foregoing test is done 3 times with distance 1 minute rest between each time test performance. If the subject, at the same time is committed several errors, only 1 error is recorded. For example, if the subject at the same time steps, open his eyes, and his hands take over the back, only 1 error is recorded for him. The subjects who are not able to continue the test at least 5 seconds, takes the most negative point, i.e. 10.



Figure 1: measurement of static balance with open and closed eyes

Method of measuring dynamic balance: Due to being similar Y-balance test results to star balance test ,we used y- balance test in this research (Khorram Nezhad 1389). Subject stay in the Center of directions and then set on one leg and with the other leg perform the Act of acquisition and returns normal on two feet. The subject has touch the possible farthest point in each determined direction, distance access is the distance of contact location to center which is measured and recorded in centimeter. The achieved numbers is divided on the leg length measure , and multiplied to 100 until data were normal (Figure 2). In order to get the dynamic balance score in each direction separately we use the specific formula.

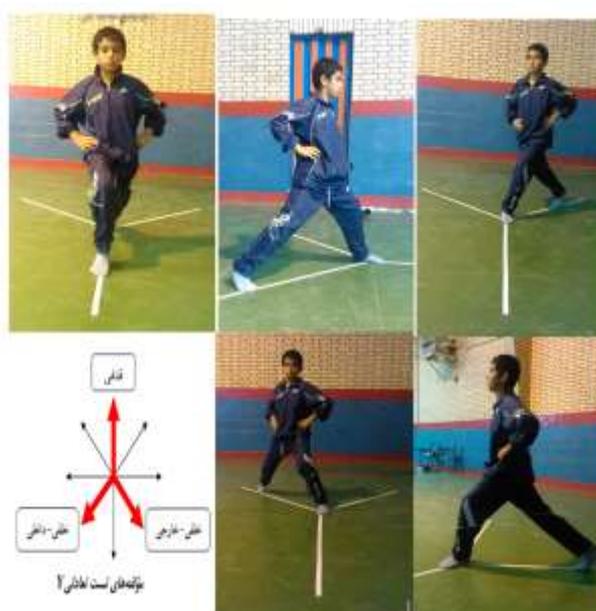


Figure 2: how to do a balance test Y

The program statistical software Spss has used For the statistical analysis of the data. Non parametric test of Kolmogorof –esmiyernef comeliness was used for ensuring being normal data distribution. Then for being normal data distribution , variance tests (One-way ANOVA) and tucky test, dependent t -student were used for considering the test research hypothesis.

Findings

(A); There was no significant difference between the influences of 8 weeks combined exercises on the static balance of low mentally boy and girl children.

Table 1: Influences of 8 weeks combined exercises on static balance of low mentally boy and girl children

Significant level	quantity F	Squares average	Squares sum	
0/0001	25/2	5/59	11/2	Between group
		0/22	9/3	Inter group
		-----	20/5	sum

Table 2: Average difference in static balance determination using Tukey's test

Girl group control

Control group	girl	
1/21*	0/47*	boy
0/0001	0/17	
average difference	0/74	Control group
The significant level	0/0001	

(B) There was no significant difference between 8 weeks combined exercises on dynamic balance of low mentally boy and girl children.

Table 3: Influences of 8 weeks combined exercises on dynamic balance of low mentally boy and girl children.

Significant level	quantity F	Squares average	Squares sum	
0/001	8/9	7598/8	15197/6	Between group
		852/6	35810/9	Inter group
		-----	51008/5	sum

Table 4: Determination of the average difference of dynamic balance using Tukey's test
Girl group control

Control group	girl	
1/21*	3/5*	boy
0/0001** 0	0/94**	
average difference	0/74	Control group
The significant level	0/0001	

(C) There was significant influence in eight weeks combined exercises on static and dynamic balance of low mentally boy and girl children .

significant level	dependent quantity t	Change measure (%)	Average and standard deviation		group	balance
			After test	Pre test		
0/0001	8/42	-35/6	0/76±2/29	1/03±3/5	boy	static
0/0001	4/9	-26/9	0/4±2/03	0/73±2/78 2/78	girl	
0/65	0/46	-0/33	1/1± 3	1/1±3/01	control	
0/0001	-5/4	+21/9	25/9± 232/7	23/5± 190/8	boy	dynamic
0/002	-3/7	+20/3	30/9± 228/3	23/8± 189/8	girl	
0/55	0/92	+0/62	32/8± 210/5	33/5± 209/2	control	

Discussion and conclusion

The results of the research suggested that 8 weeks combined workouts was caused to improve the experimental group static balance in low metal boy(35/6% recovery) and girl (26/6% recovery) children (P = 0.0001), but there was not observed difference between the two groups of boy and girl(P = 0/17). As well as 8 weeks combined workouts was caused to improve dynamic balance in the experimental group of low mentally boy(21/9% recovery) and girl(20/3% recovery) children (P = 0.001) ,but there was not observed the differences between the two groups of boy and girl(P =0 /94). Results of the present research is consistent with pirani and colleagues(1389), Hosseini and Sadeghi (1389), Abdi and colleagues(1389), Ahmad and colleagues (1390),dast manesh and shojaedin (1390), daneshmandi and colleagues (1392), nadler (2004), lefart and colligues (2005). One of the reasons for instability and reducing of balance in people is reduction of muscle strength in the lower limbs and increasing the reaction time. As well as reduction or delay in removing the nerve messages to the central nervous system or transfer the message to the limbs especially the muscles was caused to reduction of the muscles sensory and dynamical function and this issue reduce can caused reduction of the balance in the people (borah, 2007). A decrease in the ability of reflexes and also reducing the power of muscles of the central area of the body such as abdominal straight muscles, abdominal width , and external transverse muscles can caused the weakness of the balance (piegato, 2003). The researches have shown that

strengthening the muscles of the central area of body helps to functional ability and improving of balance in people (piegato, 2003). The increasing of muscle strength, The central area of the body improves dynamic control at the level of the Central and peripheral nerves and ultimately balance.The researches have shown that contraction of muscles the central area of body before moving the limb, was been the reaction of posture prediction which prevents from posture disorder and participate in organization of dynamic balance, so the central constancy of body helps to recovery of activity prediction and consequently decrease of disorder in suppland and oscillation of central of body gravity(tooris,2001). In central stability, a specific muscle is not active alone but a set of muscles of the central area of body with their continuum contraction activate for maintaining body posture status and decreasing posture oscillation that is lead to recovery of activity in muscle-nervous system .Moreover from the point of anatomical ,the center is an area that the central of gravity has posed there and movements is due from there(gambeta,1999).So it seems that strengthening of muscles of this area is caused to recovery of muscle-nervous system and decreasing of suppland gravity in out of reliance surface and decreasing its oscillation .The mechanic receivers give this possibility to muscle-nervous mechanic that with suitable sensory –deep seated feedbacks ,maintain the connection of tension length and a pair of force in three passive ,active and nervous system. Strengthening the central stability ,gives recovery to the efficiency of muscle-nervous system for mentioned tasks which was caused to desired movement of joins ,back

,pelvis and thigh along the operational dynamic chain ,capturing the acceleration or decreasing suitable acceleration, suitable muscle balance, strengthening proximal and operational power (tooris,2001).In fact ,if the power of limbs muscles be much ,but the central area of body be poor ,the sufficient force will not generate to desired function (bergmark,1989).These effects is lead to desired function and increasing the power ,thereupon of increasing muscles power, lower limbs can accomplishes more suitable the muscle stabilization.

One of the other explanation of the effect of muscle strengthening connected to central stability of body with balance is this contraction of central muscles before moving the limb, is fade forward conditional reaction .From the central nervous system which

prevents from conditional disorders and participates in organization of dynamic balance ,so strengthening the central stability is may be lead to recovery of predicting the activity and consequently decreasing disorders in translocation of central gravity oscillations(Panjabi,1992).Also generated torque well annihilated during the better access action and at last dynamic balance is more maintained (gribel,2003). The potential improvements in the sustainability of the central area of body is associated with activation level of the muscles building of the central area of the body. When it can be inferred that increasing the sustainability of the central area of body is lead to dynamic balance progress ,could not be concluded that no change is experienced in the pattern of muscle activation .Although necessity to more researches is felt in this case.

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