IJBPAS, July, 2015, 4(7): 827-840

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

CONTEXTUAL INTERFERENCE EFFECT OF INCREASING SYSTEMON PERFORMANCE, LEARNING AND TRANSFER OF GENERALIZED MOTOR PROGRAM FOR PEOPLE WITH INTELLECTUAL DISABILITY

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ABSTRACT

The goal of research is surveying on the effect of different methods to practice blocking arrangement, increasing system & randomly on acquisition, learning & transferring basketball pass in people intellectually disability.

Method of surveying: among 120, 12-16 years old girls with intellectual disability, who didn't have any training experiences in skills criterions area, are selected 30 persons randomly & then they are tested after general justification, so they are divided in to the three groups with different methods practice arrangement. The groups exercise 9 days regarding to the practice arrangement, retention test within 48 hours after the last training session with 4 attempts per pass, &delayed transfer test was done 48 hours after last training session with 4 attempts per pass in basketball.

Findings: there was significant difference in deductive phase among the results of complex variance analysis of exercise session factor 9 attempts with other attempts (P=0.001) while the effects of groups, interaction group, training sessions were not meaningful (P=0.83). The results of analysis variance of one-way learning test showed there was significant difference between the three exercise groups (p=0.006). The results of analysis variance of one-way transfer test showed that there was significant difference among groups (P= 0.000).

Conclusion: regarding to the learning & transfer tests can be concluded that background interference with increasing systematic arrangement is more useful than blocked and random learning and skills transfer in people with intellectual disability.

Keywords: Blocked, Background Interference, Increasing Systematic, Randomly

INTRODUCTION

Most of the experts believed that physical-educational programs must be had coherent structure& be proportional their needs & issues for persons with motive & perceptual deficits [1]. The characteristics of children with sensory- motor disorders is; most of them have problems in doing the gross motor skills, understanding of space, time, and direction-finding body and motor skills[2],these kinds of problems caused to the children have movement poverty & become clumsy in doing some movement & be weak in physically [3, 4]. Mental retardation syndrome is one of the mental-perceptual disorders in growth era, that it onsets before the adolescence, & specifically, the children are called that children have deficit in cognitive mechanism &adaptive behaviors. Traditionally, children with lower IQ gain of 70 are classified in group of persons with mental retardation & these disorders & anomalies are listed in 5 five categories by Diagnostic and Statistical Manual of Mental Disorders, and the American Association of Mental Retardation. Regarding to the this list children are classified in to; children with IQ 70-85 as mental retardation, were in borderline intellectual functioning group or unapt group & children with 50-69 IQ were in the mild group. Children are classified in to the two classes of children with moderate mental as educable mentally retarded persons, persons with severe mental retardation IQ 34-20, and the IQ of children who are under 20 are measured and presented as profound mental retardation[5, 6].

National & international statistics estimate the level of children's disorders as 5-14 percents[9¸8, 7] that approximately 70-90 percents of them suffer from mild mental retardation[7].

In at all, children with retardation are behind of other friendship in learning language skills, memory skills, learning social rules and problem solving skills[6, 7]. Sometimes, children with mild mental retardation can obtain to the main steps of physical development, but because of problems in cognitive & psycho-motor development. They have poor performance in capabilities of perceptual - motor coordination, balance, spatial awareness, time, physical and

environmental orientation that involves the integration of information and decision to perform a particular action [8, 9]. Children with mental retardation obtained lower scores in motor skills than normal persons & also they learn slower these skills than others [11, 12]. Children with mental retardation typically are poor body condition and do not have a lot of physical vitality.Their steps are unbalanced and unstable, and show that they are weak overall coordination[11]. Moreover, the problems in intention & accuracy caused to disorders in perception of spatial relationships, orientation, and recall, diagnosis, learning and shaping concepts [12].Carmel & et al surveying [13] in 2008 showed that persons with mild mental retardation obtained lower scores than normal persons in tests of perceptual – motor because of disorders & impairment in integration of sensory and motor information& their balance are lower than health persons.

Although persons with mental retardation have lower talent but their tendency to participating in sport activities & learning are not lower than normal persons. It is clear that children with mental retardation must be developed in terms of physical fitness, motor skills and body mechanics[12]. Finding the effective & meaningful ways for facilitate in learning is challenging for persons with retardation. The evidences showed that educational interventions designed to promote higher levels of cognitive processing, has helped people with mental retardation [14, 15].The question makes whether by exercising activities & experiences can provide the sport skills learning era for children with mental retardation or not?

Since the most important factor of exercising learning is deliberate exercises, so the coaches or teachers' training designs must be comprehensive & complete regarding to the nature of effective skills and other factors& reflects the conditions that skills performance [16]. Perhaps, more important than the exercise, is a way of organizing training. Organizing training is the most important challenges in exercising designs for coaches. In this regard, one of the exercising organizationmethods is practice arrangement that it is induced as blocked & random chain[17]. The outward of appearance showed that using blocked practice & exercise would be better, when paying attention to the effects of diversion activities in motor memory, random exercises & practices must lead to learninginterference & this subject showed as performance evaluation. For example, immediately after training, implementation or performance is tested; blocked practice leads

to better performance. Batig (1979) called it as contextual interference[18].

There were different attitudes in why contextual interference leads to different conditions of performance & learning. Shes& Morgan (1979) provided expansion theory & believed that when we performed skills randomly need to the more planning than conditions when pay attention to the one skill (such as blocked exercise & practice). So they compared retrieval, recognition and emotional consequences of skill, as result, retention will facilitate&occurmore learning[16, 19, 20].

Lee& McGill disagreed with this theory & proposed the restructuring plan of action theory [16, 19, 20]. Based on their theory, learners experienced all or part of skills forgetfulness when they performed the skills. Person must re-design or re-plan the methods of skill performance when he/she returns to the before (forgotten) skill. This stage helps to the schemes formations. There is not any evidence that prefer one of these theories than others [20]. However, the field results researches about this subject, is very antithesis, as it is not seen the effects of contextual interference in Meira&Tani[21] darts skills surveying in 2001, Shewoksicomputer games surveying [22] in 2003, Jones & French Volleyball skills surveying[23], Vera, et al [24]motor skills surveying in 2008.

In at all, the effects of contextual interference affect by variables such as; the amount of exercise, tasks, measure performance and learning of motor skills and characteristics of subjects. In this regard, some researchers studied on factors affect on contextual interference; Mingle & Hall [7] studied on the kind of exercise (included generalized motor program or some kind of generalized programs), She [25]studied on amount of exercise in 2001, Bortoli, et al [26] in 1992, Jones & French [23] studied on the level of skills of Learners & the kind of skills (open or close of skills),Jarus T, Goverover Y [27] studied on the age factor in 1999. It can be said that some of cases are not appeared which affected on contextual interference, perhaps, other variables affect or dilute on it such as; amount of training, skills and experience of the learner, the skills and the role of mediation and intervention. In most of researches paid attention just to the two extreme points of a continuum of interactions background that blocked exercises were considered as down contextual interference & random exercises were considered as high contextual interference & ignored other levels of interference. Recently, surveyed on exercise (practice) arrangement in motor

learning literate, one of them is; increasing systematic contextual interferencewhich referred to the gradual increase of the contextual interference during practice[7]. There were a few researches which studied on it, so one of the goals of this research is testing the positive effects of exercise with systematic increasing contextual interference in the performance (acquisition) and learning (retention and transfer), otherwise, Al-Ameer& Toole [28] in 1984, Pigot& Shapiro [29] in 1994, Bortoli& et al [26]in 1992, Hebert [30] in 1997 emphasized on the superiority of group blocked – random group on random group on learning and transfer, but Jones & et al [23]& Jared & et al [31] didn't see any difference in it, in 2007.

Regarding to the done researches, there were different & opposite theories in about useful of different method of exercise (practice) arrangement in acquisition, retention and transfer of motor skills& in the most of researches there was stand amount of contextual interference (blocked random & chain). Researcher tried to surveying on the contextual interference, it means studied on systematic increasing & also compared the level of effectiveness of exercise (practice) arrangement with random & blocked exercise (practice) arrangement among persons with mental redartaion in learning of motor plans. In this research educable mentally retarded participants surveyed on an experiment of the effect of different levels of contextual interference & also by a gradual increasing of hardness of exercise can be caused to more learning in the transmission and retention more difficult to practice learning.

METHODOLOGY

As said, the goal of recent research is comparing the effects of different exercise arrangement (blocked, systematic increasing& random) for acquisition, basketball pass skill retention (bimanual top of the head, chest pass and a handy side)& also one hand pass overhead in transition stage. The method of research was experience, different exercise (practice) arrangement (blocked, systematic& randomly increasing0 as independent variables & the level of acquisition, retention & transfer the criteria skills & dependent variables. For obtaining the goals are selected randomly 120 students with mental retardation (with IQ level 70-85) 30 persons with mental retardation 12-16 who didn't have any learning & experiences in basketball in Kermanshah. After general reasoning was done the test on the manner of doing exercises on personal characteristics records (such as age & high) & criteria & evaluation the skill. Regarding to the pre-test score, they placed in

the three groups randomly (blocked, systematic increasing& random). Subjects did pass of basketball during 9 days & each day doing 9 attempts, regarding to the exercise plan for each group in three kinds of pass (A:two hands above head pass, B:chest pass, C: handy side).the motor program variable & the number of attempts & amount of distance (4 meters in acquisition stage) are same in all passes. Each participant did 27 throws & in at all 81 throws in exercise course. Blocked group did 27 attempts in A status & then 27 second attempts did in B status& 27 last attempts did in C status. The systematic increasing group did 1-27 attempts as block (9 attempts in each pass) & in continues 28-54 attempts as chain (average level of blocked & random exercises). For example they did A, B, C, as repeatedly (each pass, 9 attempts)& did 55-81 attempts in equal of three passes as randomly. Random group did all attempts randomly in three passes. They are tested after last session. Delaying retention was done after 48 hours, by 4 attempts (of each pass in at all 12 passes) with arranging the small formats and transfer test with 12 passes over a distance of 4 meters. Scoring in experiment was done by measuring the level of standard deviation (absolute difference between fact performances in each attempt & goal), the goal of pass was 20 he horizontal line at a distance of 10 cm from each other, that design in 4 meters distance (in acquisition stage) from subject on wall,lines in order from top to bottom of the score was 9 to -9, & the last line distance between two points 9 and grades 8 to zero and then the scores were graded 1 to 9. If ball faced on one of lines, the score will be lower score between two lines. For example, when the ball came down on the line between the two regions 5 and 6, a score of 5 was awarded to the bowler (Migle, 2008). For analyzing the data was done ANOVA analysis test and one-way variance test and Tukey test.

RESULTS

the results ofcompound ANOVA analysis on exercise sessions showed significant difference between fist, second & ninth attempt categories with others attempt categories (P=0.001), while the effect of groups, group interaction & exercise sessions were not significant P=0.083, in other word, there was no significant difference between the level of effects of different methods of block, systematic increasing & random (Table 1).

The results of one-way variance analysis showed significant difference in retention test P=0.006 as post hoc testshowed that systematic increasing group & random test in retention test is accurate than blocked group's

function (increasing P=0.007, random P=0.031). Also there wasn't seen significant difference between systematic increasing & random groups.

The results of one-way variance analysis showed the significant difference in transferring test between groups P=0.000 as the post hoc test showed that systematic increasing group & random group were accurate than blocked group in transferring test (increasing P=0.000, random P=0.001). Also there was no significant difference between systematic increasing & random groups (Table 4 & 5).

Table (1): the findings of compound ANOVA analysis for comparing groups' performance in acquisition stage

Indexes Changing resource		Total of squares	Freedom rate	F	P
Internal subject	Factor (exercise)	48.71	4.61	4.81	0.001
	Group * test	43.35	9.22	1.75	0.083
	Deviation	273.33	124.54		
Between subject	Group	3.64	2	0.38	0.68
	Deviation	126.53	27		

Table (2): the results of one-way variance analysis test in retention stage

	Total squares	Freedom rate	F	P
Between group	0.068	2	6.250	0.006
Internal group	0.147	27		
total	0.216	29		

Table (3): Tukey post hoc test for comparing groups' performance in retention stage

Variables		blocked	Systematic increasing	Random
blocked	Different means		0.11	0.089
	P		0.007	0.031
Systematic increasing				-0.021
	P			0.802

Table (4): the results of one-way variance analysis test in transferring stage

	Total squares	Freedom rate	F	P
Between group	23.045	2	17.842	0.000
Internal group	17.437	27		
Total	40.482	29		

Table (5): Tukey post hoc test for comparing for groups' performance in transferring test

Variables		blocked	Systematic increasing	Random
blocked	Different means		-2.077	-1.509
	P		0.000	0.001
Systematic increasing				0.568
	P			0.271

DISCUSSION

This research was done with the goal of comparing the effectiveness of three levels; low, average, high & grade increasing of contextual interference in three kinds of pass of basketball among persons with mental retardation. The surveying on the performance of acquisition stage showed that changing of exercise arrangement didn't make any difference among groups in term of goals. In other words; the effect of exercise sessions was meaningful in all groups. This result is same as results of acquisition stage results on

about sport skills[29, 33, 35]& also this part of results were used in laboratory assignment. [22, 27, 36]. This difference was because of nature differences in laboratory assignment & field & the number of exercise sessions & also system of scoring [37].

Learning of basketball skills, shoot from various distances and angles, Landin& Herbert [37] didn't see the effect of contextual interference in acquisition stage. Lotfi& et al failed to observe the contextual interference effect in the acquisition phase in learning about different throw distances[38]. There were a lot of researches in about sport fields or motor skills of real world that they showed same results. For example, Salmoni et al [50[studied on the for-hand & back-hand in tennis, Hatami& et al [39], Koufou et al [40], Sekiya et al [41] studied on the volleyball skills.

In the delaying retention test that was done after two days after last exercising session, showed that there was significant difference between exercise arrangements with different levels of changing among groups as the mean of absolute deviation of systematic increasing group is significant lower than blocked group, but there was no significant difference between mean of deviation of random group & systematic increasing group. The results of this research is same as Del Rey's (42) result research in against there were findings that they showed; when different expending motor skills & plans are controlled, high interference don't affect on sport skills learning [43-45].

Delaying transferring test was done by changing the kind of pass & found the similar findings of delaying retention test. The results showed that the mean of absolute deviation of systematic increasing group is better than blocked group & there was no significant difference between systematic increasing group & random group. These results are same as Shea &Titzer[49], Green &Sherwood[48], Sohrabi[47], Foladian[20] also Porretta's[14] results determined these results, too in 1994. Robert et al [15]studied on the motor skills transferring &learning among persons with mental retardation by blocked & random exercises in 1989 & showed that there was no significant difference between blocked & random groups on skill transferring & retention.

Traditionally, in done researches in about high contextual interference (random exercise) & low one (blocked exercise) & their results were determined by Shea & Morgan although there is disagreementamong researches, but this hypothesis; the contextual interference affects on motor learning, is accepted. Although, high interference caused to decreasing the performance among persons with mental retardation in acquisition stage but it is considered as effective factor in facilitating the motor skills learning. In the meta-analysis that has been done in this field have been significant factors in the effects of interference [33, 34], these factors included; similar task, the amount of interference imposed, and flexibility exercises. In this study was used the model of basketball pass. In arrangement that is named by increasing word, then the level of interference increased in continues of exercise sessions in each session with a certain proportion

of gradual and orderly (block randomization). In at all, it is showed that exercises with increasing arrangement characteristics is better than blocked method, in the other word, this research showed that; if contextual interference increases gradually, make a profit for skill trainer. It seems that observed differences depend to the participants' understanding levels of exercised skills & the method of call & method of running the motor plan form memory. In other words; individual learning depends on the learner's ability to process information and symptoms related to skill performance. The results of recent research expend the model which was provided by Guadagnoli& Lee [35]. This model said likely to continue to increase the level of skill and training, comprehensive information processing capacity has gone up& caused to learners understand better in relationship between the components of skills training. Other change, which is happened in increasing exercise group, will be justified regarding to the triple motor skills learning [35]. Most likely in the first session, the learners have difficulty in recalling the memory of the movement, with blocked practice arrangement, the efforts of successive applications of motor skills will be in working memory& did not have any time to enable the recruitment process. As a result; learner can analyze the cognitive problem that related to understanding the method of doing skill, the method of scoring & … in against there wasn't this characteristic in group that firstly worked with exercise arrangement. With continued practice and likely to resolve the problems and made verbal cognitive or motor remediation program need to several times the motor program is retrieved from memory, till the process of memory consolidation is formed. It seems that this condition is caused by the gradual increasethe concurrent interference level with progress from cognitive stage to associated stage, while this feature is not available in practice block arrangement.

The findings can be analyzed with other attitude. Gentile [45] proposed that leaner needs to initial & repeated exercises for obtaining correct performance & goals. He said the order of exercise goals as; discovery (appreciate) and the pattern of movement through trial and error, achieve a basic movement patterns, movement patterns of refinement and adaptation to environmental conditions (fixed) and the use of this model in different situations (change). Based on this, for facilitating to obtain initial goal of exercise, this research design & plan the increasing group that they used blocked arrangement exercise for initial session. Regarding to the last researches such as; Brady [33], Jefferys[46]& Magill & Hall [32] which they proposed that when learn the complex task & exercise or sport skills, it is better educational environment is somewhat hard (hardness desired) to surround each involved in the problem solving process. Permanent involvement the most likely causes to when a learner faces a new challenge in practice adopt the optimal solution much faster and easier. We surveyed the gradual increasing interference mechanism in two aspects; one the

learning information processing capacity during exercise & other; necessary conditions for the practice of gradually increasing difficulty.May be parallel development that happened in the hard exercise & increase processing capacity justify this why the designed exercise program caused to better performance of order arrangement of interference than random group.

The obtained results of this research caused to direct & indirect practical usages. In learning the basketball skills to persons with mental retardation proposed to coaches to instead using traditional methods with making effective conditions of learning use exercise program with increasing arrangement, as first use the blocked arrangement & then use random arrangement. The effectiveness of increasing interference method of skill learning (basketball pass skill) is surveyed in this research. Regarding to the other researches that surveyed on the contextual interference in cognitive skills learning, using therapeuticwork can be proposed that if teachers, coaches &educational experts & coaches use increasing interference method, so facilitate the training progress.

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