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## EFFECTS OF MOVEMENT EDUCATION PROGRAM BASED ON BLUE AND GREEN COLORS ON VANILLYLMANDELIC ACID AND MOTOR ABILITIES FOR CHILDREN WITH ATTENTION DEFICIT/ HYPERACTIVITY DISORDER

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### Abstract

*Purpose.* We respond to the colors in everything we do, whether we realize it or not. You respond to a traffic light changing to green or from yellow to red. You respond to red and blue flashing lights on a fire engine or sheriff's car. You also respond to the color of your environment such as a classroom, office building, or your own home. Responses to room colors are found below consciousness. The question is how do we respond to these colors and why? The aim of this study was to determine the effect of movement education program based on blue and green colors on Vanillylmandelic acid and motor abilities for children with attention deficit/ hyperactivity disorder.

*Methods.* The sample consisted of 30 kids from Arab Republic of Egypt and used in this study, all participations divided into equally to (2) groups (experimental groups -15kid) and (control group -15kid), the experimental group performed the education program based on blue and green colors for (8) weeks, and the control group practiced the traditional training only into the kindergarten.

*Results.* The results indicated that increased significantly between the pre and post measures for the experimental group except the plat-tapping, Hand Grip, Sit - Ups test, and Bent Arm Hang.

*Conclusions.* The results indicate that two months of the movement education program program can improve physical variables, and reduce the hyperactivity.

*Key words:* color, motor abilities, kids.

### Introduction

The movement is one of the necessities of life for the child, he cannot live without also dependent child's upbringing and development of his physical, mental and psychological movement, it is in which to learn and grow and develop so it was necessary to emphasize the importance of the role played by education mobility in the educational process, especially with children in the stage First and always movement is a fundamental way to express their thoughts and feelings and self - concepts and in general, they are noticeable physical response to the stimulus, whether internally or externally, and most important what distinguishes it is that the wide diversity of forms and methods of performance.

(Acosta, et al. 2004) indicated that the kindergarten occupied a privileged position in the concerns of many countries of the world in recent times, including the Arab Republic of Egypt, is the attention of the most important criteria, which is measured by the progress of nations and advancement, where it became a wealth of peoples is not measured with all its territory of but the extent of natural treasures refined to the talents of their children and help them healthy growth in order to contribute to the establishment and advancement of civilizations.

Indicates (Osama, 1995) that a child at this age to friendly natural tendency to play and movement, and through this tendency child learns by practice, has

high-end scholars of modern education to the importance of play and movement and found it an advantage of features that must be tapped and utilized, and can be child-rearing and the development of his physical, mental, psychological, social and ethical whether in the case of movement and activity endeared to itself.

(Foneset al. 2000) that one of the basic objectives of the studied physical education is to provide the means and the pillars of the integrated development of the child in terms of physical, motor and social development.

Consistent (Lee, 2001) that the activities of small toys that cares about them studied physical education activities are the most common and the exercise by children within the lesson and abroad and contribute a significant role in the development of motor skills essential where it is these skills base practices kinetic where the child care practice and develop longer a mainstay of the practice in motor sports activity Specialist.

In addition to being physically active, children need to learn fundamental motor skills and develop health related physical fitness (cardiovascular endurance, muscular strength and endurance, flexibility, and body composition). In another word, Physical education is an ideal way to encourage activity and develop fitness among children and, for many children, will be their only preparation for an active

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lifestyle. Evidence also exists that physical education may enhance academic performance, self-concept, and mental health (Johnson, & Rosen, 2000). It also offers an opportunity for therapy, but it is seldom exploited properly.

Hyperactive children typically have a rough time in PE because of their poor listening skills, distractibility, and impulsiveness. Therefore, fencing sport is one of the sports that are beneficial because it involves structure, rules, rituals, a stop-and-think attitude, and absolute obedience. No techniques are taught until the children have learned to stop, listen, and think. The techniques involved in this sport are usually monitored carefully, emphasizing over and over that these are sports and are not to be used for any aggressive play.

Clearly there are some hyperactive children, who need drug therapy, but for a lot of children, the reality is that physical activity, movement, sport could at least reduce the severity of the condition. Researchers in the present study therefore applied the basic fencing skills program for the hyperactive children. Then they compared the children's activity level before and after the program, besides measuring the physical variables included in the physical fitness scale, in order to measure the effect of the program on these variables. On the other hand, they measured the urine catecholamine for those children, as a reflection for the physiological changes too.

Often described as a child who suffers from hyperactivity child bad or difficult or child who cannot adjust. Some parents bothering them hyperactivity in their children through punish them, but the punishment increases the problem worse. Also, forcing the child to something cannot work exacerbates the problem and is a disorder locomotors activity overload medical condition satisfactory launched in the past few decades, several labels including syndrome hyperactivity, brain damage simple, and so on, which is not a simple increase in the level of physical activity, but a significant increase is so that the child cannot sit quietly never, whether in the classroom or on the dining table or in the car.

(Wolraich, et al. 1998) noted that excessive motor activity disorder is one of the most common neurological disorders among children and it is primarily due to genetic reasons due to the absence of one of the genes.

And reminds (Lee, 2001) that the locomotors activity overload in children common disorder and increase the prevalence of the male three times with him in females, although the disorder occurs in the early stages age early, but it is rarely diagnosed in children in pre-school.

(Nolan, et al. 2001) indicate that this disorder usually appears before seven years of age and lasts at least six months may disappear or continue a year or two as the causes of the situation, and the advantage of history infected child activity, motor overload in the early years of his life with three features a frequent

crying, sensitivity delicate external stimuli, and is suffering from sleep disorders.

This situation is not considered learning difficulties but the problem behavior in children and have these children usually hyperactivity and aggressive and cannot focus on something for more than a minute, usually mental capacity for these children normal or closer to normal, and be the main problem in children with such syndrome is that excessive motor activity disorder does not help them to make use of the information or stimuli around them, so the benefit from mainstream education or weak in the normal way, where they need first to control the behaviors locomotors activity overload.

(Pliszka et al. 1996) that hyperactivity is a biological neurological disorder caused by a defect in nerve cell formation is caused by an increase secretion of catecholamines hormones.

It is noteworthy (Wigal, et al. 2003) that catecholamines hormones is one of the hormones pressures. It consists of (adrenaline - norepinephrine - dopamine), and it can be inferred from these hormones in urine by measuring the Vanillylmandelic acid (VMA), this is an indication of the levels of catecholamines hormones. And that the current studies indicated the presence of correlation between the severity of sports training and catecholamines levels in the urine.

Prevalence rates range from excessive motor activity disorder between 3-5% in the community while you see some of the other studies that the proportion of 15% among school-age children. (Wolraich, et al. 1998)

The Researcher observed the lack of studies on movement education as a means of kinetic treatment of these disorders, despite their importance and positive impact on access to effective treatment and safety of this group of children.

Studies indicated the lack mobility programs are codified in a scientific manner interested in the children of this stage people with hyperactivity prompting the researcher to the number of small games program aims to teach children with hyperactivity a variety of activities based on competition with oneself and others compared to traditional programs.

## Material and Methods

### Subjects:

The sample consisted of 30 kids from Arab Republic of Egypt and used in this study, all participations divided into equally to (2) groups (experimental groups -15kid) and (control group -15kid), the experimental group performed the education program based on blue and green colors for (8) weeks, and the control group practiced the traditional training only into the kindergarten.

### Procedures

Age, height and weight were recorded. Height was assessed with a standard tape measure on a wall; weight was measured with household scales.



#### Ethical considerations:

The researchers have considered the value of research for children, parents, and community and also the possible discomfort and risk of the intervention on children's safety. Therefore there were reasons behind the use of foot work only (as a basic skill) and not using the one to one fencing between children. This was to protect them from any planned or unplanned physical injuries

Researchers also considered not using the custom and mask that they are beyond the financial ability of average social level Egyptian families. This has been also decided for other ethical reasons such as safety measures to protect those children from any un-organized movement which might put them at risk of injury.

Consent for research participation was given orally by some parents as Egyptian people usually feel uncertain if they are asked to sign any paper work. As children were protected from risk of injury, no compensation policy was included in research procedures. Children and their families were instructed about their freedom to withdraw from the study at any time if they are not happy and privacy of the clients was guaranteed.

#### Measurement instrument

##### Conners' Teacher Rating Scale.

Study subjects' activity level has been assessed using the Abbreviated Conners' Teacher Rating Scale-10 items (ACTRS- 10 items). Children's physical fitness has been assessed using the EUROFIT (European Scale Measuring Physical Fitness). Items of the EUROFIT are ten categories measuring the physical fitness but the researchers have excluded one item due to study setting circumstances (some measures are only applicable in the laboratory setting) : (1) Flamingo Balance (FLB). (2) Plate Tapping (PLT). (3) Sit and Reach (SAR). (4) Standing Broad Jump (SBJ). (5) Hand Grip (HGP). (6) Sit - Ups (SUP). (7) Bent Arm Hang (BAH). (8) Shuttle Run (SHR).

##### Motor abilities tests

The EUROFIT normally includes cardiovascular endurance element, which is not available in the community setting.

In Flamingo Balance (FLB) test, the researcher measured the general balance on one foot above a bar (its length is 5 cm and its height is 4 cm). The score (timing = 60 seconds) has been given on the number of trials to keep child's balance on the bar.

In Plate Tapping (PLT) test, Quick tapping on two plates alternatively is using the preferred hand. The circle of both plates is equal to 20 cm and each plate is 60 cm away from the other. The un-preferred hand is put on a slide that is midway of the whole distance. The researcher has taken the timing in which the child tapped on the plates (50 times) alternatively.

In Sit and Reach (SAR) test, it measures the body flexibility. In this activity the researcher measured the body flexion on the front (as much as the

child can do) from the long sitting position. The results recorded using centimeter scale.

In Standing Broad Jump (SBJ) test, It measures the power through assessing the jumping a specific distance from the standing position. The researcher has calculated and recorded the best reading in centimeter from two predetermined trials done by the child.

In Hand Grip (HGP) test, this implies the static strength of the preferred hand (hand in use). The measures were taken in kilograms using a graded manual dynamometer for the hand in use. The researcher has taken the best reading from the two trials, while a time gap (rest) in between the two trials.

In Sit - Ups (SUP) test; it measures the muscular abdominal endurance. The researcher recorded the maximum number of sitting ups that were achieved by the child in 30 seconds.

In Bent Arm Hang (BAH) test, it measures the muscular endurance of the arms and shoulders. The reading was taken in 1/10 second.

In Shuttle Run (SHR) test, the child run a ten meters distance five times (two directions). It measures the speed of running and the child's fitness. The timing was recorded.

#### Catecholamine Urine Test.

Catecholamines are substances produced by nerve tissue including the brain and the inner part of the adrenal glands. These adrenal glands produce large amounts of catecholamine as a reaction to stress. The main catecholamine breakdown into the compounds Vanillylmandelic acid (VMA) and metanephrine, which are passed in the urine.

The researchers have measured the catecholamine level in urine before and after the training program (physical intervention) for the children of the study sample. The urine sample was collected from each child to test the effect of physical exercise on the catecholamine level in urine that is expected to be reduced in hyperactive children compared with their normal control group. Special instructions were given to the children regarding the sample collection, type of food and medication that might affect the catecholamine urine test results.

#### Statistical Analysis

All statistical analyses were calculated by the SPSS.V.16 (Statistical Package for the Social Sciences). The results are reported as means and standard deviations (SD). T Test was used to compare group means in variance analysis results that were found statistically significant. Differences in means were considered if  $p < 0.05$ .

## Results

Table (1) T-test Between Experimental and Control Groups before the Intervention

Variables	Measu. unit	Experimental group		Control group		T test
		Mean	SD.	Mean	SD.	
Age	Year	5.64	.84	5.60	.88	.23
Length	Cm	116.60	4.01	115.79	4.63	.93
Weight	Kg	21.50	4.35	21.79	4.89	.31
HA	Deg.	16.56	3.82	15.98	4.19	.72
FLB	No.	7.22	1.68	7.10	1.88	.16
PIT	No.	10.19	2.13	10.56	2.41	.74
SAR	No.	4.94	1.35	4.09	1.43	.35
SBJ	Cm	121.16	4.16	120.32	3.71	1.06
HGR	Kg	12.94	2.87	16.52	2.44	.78
SUP	No.	14.0	2.15	14.22	2.29	.49
BAH	Time	10.38	2.18	10.98	2.15	1.3
SHR	Time	25.29	1.62	25.09	1.45	.64
VMA	Mg .day	8.93	.820	8.91	.69	.77

T-test result between the experimental and control group showed that both study groups were homogenous as evidenced by the lack of significant differences across all the domains of EUROFIT and other measures too.

Table 2. Mean  $\pm$ SD and T test for the experimental group.

Variables	Measu. unit	Pretests		Posttests		Change rate %	T sign
		Mean	SD.	Mean	SD.		
HA	Deg.	16.56	3.82	11.40	2.77	23.93	Sig.
FLB	No.	7.22	1.68	4.60	3.02	21.44	Sig.
PIT	No.	10.19	2.13	12.57	4.54	15.71	Not
SAR	No.	4.94	1.35	8.30	2.11	48.43	Sig.
SBJ	Cm	121.16	4.16	126.00	2.14	3.69	Sig.
HGR	Kg	12.94	2.87	18.50	2.79	9.21	Not
SUP	No.	14.0	2.15	20.20	2.39	11.11	Sig.
BAH	Time	10.38	2.18	11.69	2.48	15.63	Not
SHR	Time	25.29	1.62	21.12	1.36	10.16	Sig.
VMA	Mg .day	8.93	.820	8.05	.77	9.81	Sig.

It has been found that all the variables examined were significant except the plat-tapping, Hand Grip, and Bent Arm Hang. This could be explained by the intervention employed by the researcher (based on colors); therefore all other tasks based on arm movement skills were found no significant.

Table 3. Mean  $\pm$ SD and T test for the control group.

Variables	Measu. unit	Pretests		Posttests		Change rate %	T sign
		Mean	SD.	Mean	SD.		
HA	Deg.	15.98	4.19	14.40	3.54		Not
FLB	No.	7.10	1.88	9.55	3.13		Not
PIT	No.	10.56	2.41	11.66	4.22		Not
SAR	No.	4.09	1.43	5.32	2.43		Sig.
SBJ	Cm	120.32	3.71	121.22	2.02		Not
HGR	Kg	16.52	2.44	17.50	2.21		Not
SUP	No.	14.22	2.29	18.12	2.76		Sig.
BAH	Time	10.98	2.15	9.44	2.34		Not
SHR	Time	25.09	1.45	24.03	1.24		Not
VMA	Mg .day	8.91	.69	8.89	.54		Not

It has been found that all the variables examined were no significant except the Sit and Reach (SAR) test and Sit - Ups (SUP) test.

Table 4. Mean  $\pm$ SD and T test for the control and experimental groups

Variables	Measu. unit	Experimental group		Control group		T test
		Mean	SD.	Mean	SD.	
HA	Deg.	11.40	2.77	14.40	3.54	Sig.
FLB	No.	4.60	3.02	9.55	3.13	Sig.
PIT	No.	12.57	4.54	11.66	4.22	Not
SAR	No.	8.30	2.11	5.32	2.43	Sig.
SBJ	Cm	126.00	2.14	121.22	2.02	Sig.
HGR	Kg	18.50	2.79	17.50	2.21	Not
SUP	No.	20.20	2.39	18.12	2.76	Not
BAH	Time	11.69	2.48	9.44	2.34	Not
SHR	Time	21.12	1.36	24.03	1.24	Sig.
VMA	Mg .day	8.05	.77	8.89	.54	Sig.

It has been found that all the variables examined were significant except the plat-tapping, Hand Grip, Sit - Ups test, and Bent Arm Hang.

Table 4. Correlation Factors between hyperactivity scale and Vanillylmandelic acid & physical variables.

Variables	HA	FLB	PIT	SAR	SBJ	HGR	SUP	BAH	SHR	VMA
HA		.948**	.918**	.207*	-.150	-.101	.180	.229*	.216*	.889**
FLB			.879**	.145	-.146	-.112	.101	-.196	.181	.734**
PIT				.135	-.058	-.057	.121	-.187	.157	.147
SAR						-.714**	-.757**	-.660**	-.815**	.646**
SBJ						.663**	.580**	.621**	-.589**	.228*
HGR							.754**	-.737**	-.576**	.143
SUP								.695**	-.594**	.552**
BAH									-.608**	.717**
SHR										.655**
VMA										

Table 4. showed that there was a positive correlation between the factor of hyperactivity and all other measures included in the EUROFIT except the correlation between the hyperactivity & BAH that was found negatively correlated. This could be explained by the degree of hyperactivity exhibited by children that hinders the function of BAH in those children as their ability is quite less than the time duration in which task should be completed.

No correlation between the hyperactivity and the SBJ (Standing Board Jumb), and the HGR (Hand Grip) and the SUP (Sit-Ups) were found, this could be explaining that there is no relationship between the three tests (power measures) (SBJ, HGR, and SUP) and the hyperactivity manifested by those children.

#### Discussion

Anxiety and hyperactivity are major problems that inhibit school performance. Stop, think, and retreat strategies can reduce both of these problems. A student can be asked simply to sit quietly and engage in actual relaxation for a few minutes to collect his or her thoughts... (Refs) This practice has the benefits of teaching the AD/HD child the self-discipline of sitting still, focusing the mind, achieving a quiet state, and being able to achieve self-control through an inner-motivated, self-starting activity.

(M. Margalit, &N. Arieli, 1984)agreed that the child needs to concentrate on one specific task for only a short time. The task or technique at hand is changed into another quickly. Through the hour-long class, the child is engaged in a variety of repetitive tasks, but the tasks vary and interest is sustained. Therefore the present researchers applied these strategies to keep children on task through the whole sessions. The child was taught to develop powers of concentration, but in very short bursts that are manageable. Students were able to internalize a valuable life skill when they internalized this notion of breaking a task into small components and being satisfied with small successes (Pelham, et al. 2000).

Because children learned skills in small, digestible instructions, they also learned to develop their concentration skills in small, achievable steps. They did not need to concentrate hard for an hour or more— rather; they concentrated on executing a touch, step-forward or stepping for two minutes (Stormont, et al. 2000). Gradually, their ability to concentrate improved. The children learned to control their bodies, and to control their emotions and reactions. As they practice touch, step-forward, or stepping, they learned to control their emotions, in order to not hurt one



another if any physical friction is experienced between peers/ players.

Since it is not the motor activity that magically transforms the child, but rather the instructor that gives the child tools to address the symptoms of hyperactivity outside the fencing class, treating hyperactive children with fencing or. Other physical education programs can be more time-consuming and, sometimes, more costly, than automatically treating the disorder with the available medications. It requires considerable commitment and work from the parents, and the active participation of the child in the process.

Movement educational program emphasized concentration in a number of ways, not the least of which is the necessity to perform one technique or set of techniques over and over again in order to perfect it. This increased ability to concentrate developed gradually, just as young practitioners learn to learn in small increments and rejoice at small accomplishments. Research results supported the idea that children with hyperactivity can manage their lives without resort to medication and its harmful sideeffects (refs).

#### Conclusions

The results indicate that two months of the movement education program can improve physical variables, and reduce the hyperactivity.

#### Reference

- Acosta, M., Arcos-Burgos, M., Muenke, M. 2004. Attention Deficit/Hyperactivity Disorder (ADHD): Complex Phenotype, Simple Genotype, Genetics in Medicine.
- Fones C., Pollack M., Susswein L., Otto M 2000. History of childhood attention deficit hyperactivity disorder (ADHD) features among adults with panic disorder, J Affect Disorder.
- Johnson, R. C., & Rosen, L. A. 2000. Sports behavior of ADHD children. Journal of Attention Disorders, 4 (3), 150-160.
- Jules, R. 2002. Prevalence of attention deficit/hyperactivity disorder among adults in obesity treatment, BMC Psychiatry.
- Lee, S. 2001. ADHD/add handbook, human kinetics, USA.
- Margalit, M., & Arieli, N. 1984. Emotional and behavioral aspects of hyperactivity. Journal of Learning Disabilities, 17, 374-376.
- Nolan, E., Gadow, K., Sprafkin J. 2001. Teacher reports of DSM-IV ADHD, ODD and CD symptoms in schoolchildren, J Am Acad Child Adolesc Psychiatry.
- Osama, R. 1995. The Psychology of Sports Concepts applications, the first edition, the Arab Thought House, Cairo.
- Pelham, W. E., Gnagy, E. M., Greiner, A. R., Hoza, B., Hinshaw, S. P. & SWANSON, J. M. ET AL. 2000. Behavioral vs. behavioral and pharmacological treatment in ADHD children attending a summer treatment program. Journal of Abnormal Child Psychology, 28 (6), 507-525.
- Pliszka S., Mccracken J., Maas J. 1996. Catecholamine's in attention-deficit hyperactivity disorder: current perspectives, J Am Acad Child Adolesc Psychiatry, Mar.
- Stormont, M., Zentall, S. S., Beyda, S., Javorsky, T., & Belfiore, P. 2000. Playground Contexts For aggression for preschoolers with hyperactivity. Journal of Behavioral Education, 10 (1), 37-48.
- Wigal, S. Nemet, D. Swanson, J., Regino, R. Trampush, J., Ziegler, M., Cooper, D. 2003. Catecholamine response to exercise in children with attention deficit hyperactivity disorder, Pediatr Res. Epub, Mar.
- Wolraich, M., Hannah, J., Baumgaertel, A., Feuer, I. 1998. Examination of DSM-IV criteria for attention deficit/hyperactivity disorder in a countywide sample, J Dev Behav Pediatr.