

THE EFFECT OF AN EDUCATIONAL TRAINING CURRICULUM USING THE MENTAL FLEXIBILITY AND PERFORMANCE BATTERY (HRP) IN DEVELOPING SOME MENTAL PROCESSES OF TABLE TENNIS PLAYERS

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ABSTRACT

The aim of the current research is to prepare an educational training curriculum for cognitive skills according to performance (HRP) and some basic skills for table tennis players for the deaf and dumb, as well as to identify the level of some of the targeted skills, including mental, psychological and cognitive that are more discriminatory in performance for first-class players in table tennis, assuming there are differences between the average scores Players in the tests mental flexibility and performance battery (HRP) determined according to the performance battery (HRP) for table tennis players who are deaf and dumb. If the researcher selects his research sample and they are young table tennis players who represent the Middle Euphrates, then a sample of them is selected and their number is (20) representing Two experimental groups, and based on the cognitive resilience system (HRP), a developmental curriculum was prepared for them to improve their psychological, cognitive and mental capabilities by 16 educational units. Experimental tests (processing, memory, emotional intelligence) when using the performance system (HRP). The results also showed a clear improvement for the members of the experimental group A in the post-tests (attention focus, attention flexibility, decision-making, attention flexibility, general attention) and that the percentage of the contribution of psychological and cognitive variables to the level of two players was uneven from one player to another.

Keywords: *educational training curriculum; performance system (HPR); table tennis*

INTRODUCTION

The tennis ball game is one of the popular individual games that has been widely spread in Western and Arab societies. It is practiced by most groups of society, as it does not need a large number of players. M, the match is held on a rectangular table with legal dimensions of the steel type, the table is divided by a net along its length in two halves of a certain height. The winner is decided based on the number of points he gets during the match, the total of which is 10 points. Where he wins whoever achieves 11 points first, and when both players reach a point 10/10, the tie must be broken by giving two consecutive additional points. Sport requires high concentration,

reaction speed, and high physical fitness because it is a fast sport, and it has recently become widespread among people with special needs, including the deaf and dumb. It is important and influential in achieving an advanced level in various competitions, and as a result of the development of measurement stages and their dependence on the technology side and the emergence of integrated systems and the addition of tests and programs that differ in their advantages from one system to another, the trend was to use this electronic performance system and include it in the training and development process for those variables in addition to measuring Psychological, physical or mental variables. Which contributes to the development of the training process on a large scale, especially with individual games that require mental and psychological skills in addition to high physical, and here lies the importance of the current research to stop the role of the HRP performance system in training and developing some psychological and mental variables on deaf and dumb tennis players in Iraq.

RESEARCH PROBLEM

The problem of the current research lies in the non-use of electronic systems in the field of sports and through the researcher's experience in the field of education and psychological and skill tests in the field of tennis (table), as well as his dealings with individuals with special needs who are deaf and dumb and his knowledge of the entire Arab and Iraqi research in this field. It was not noticed that there is an academic approach to deal with these electronic systems directly.

And the table tennis game is characterized by a fast rhythm and continuous movement, as it is one of the games that needs a very high level of attention, intelligence, and processing of motor decisions. Thus, knowing the level of mental and cognitive abilities of table tennis players is very important in setting a prior perception of how the player behaves, so the researcher decided Preparing a training program based on a battery and performance (HRP) and knowing its effect on some mental variables and the skill of players, and this link is close between the mental and cognitive abilities and motor skills of table tennis players, especially as it is the main controller of proper motor performance, and from here the research problem is determined in the following question:

Are there differences between deaf and dumb tennis players in the level of a certain set of basic skills and some cognitive skills?

RESEARCH OBJECTIVES

1. Preparing a curriculum for training according to the performance battery (HRP) for first-class table tennis players..
2. Identifying the level of mental and cognitive ability that is most discriminating in the performance of first-class table tennis players.

RESEARCH HYPOTHESES

1. There are no differences between the average scores of two players in performance (HRP) determined for players of the first degree in table tennis.
2. There is no difference between a cognitive model of performance (HRP) for first-class players in table tennis.

RESEARCH FIELDS

1. The human field: the first-class table tennis players in Iraq.
2. Time range: 2/13/2021 – 4/17/2021
3. The spatial area: the hall of the National Center for the Care of Sports Talent - the Ministry of Youth and Sports, and the hall and halls of the Housing Center in Diwaniyah

TERMS DEFINITION

1. Mental flexibility and performance (HRP)¹: A laboratory of British origin that contains batteries, tests and training programs, as follows: - (Allen Wade: 1990: 36)
2. Cognitive skills: Perceptual mental abilities related to focus, attention, fluid intelligence, and other processes related to performance.

RESEARCH METHODOLOGY AND ITS FIELD PROCEDURES

Research Methodology and its Practical Procedures

Research Methodology

In the research problem, the researcher used the experimental approach with two groups, the control and the experimental, with the pre and post test, as it is the best method to answer the research questions.

Research Sample and Community

The researcher chose, in a manner consistent with the question of the study, the community, who are the deaf and dumb players in table tennis for the year 2021-2022, whose number is 28 players distributed in three governorates (Diwaniyah, Hilla, and Najaf), taking into account their homogeneity with the school variables in addition to the chronological age and the training age.

¹ Allen Wade(1990); Guide to Training and Coaching. : (London). p39-37.

After that, he resorted to forming two groups, each group consisting of ten players for the control and experimental groups, as shown in Table (1).

Table (1): The Homogeneity of The Current Research Sample

Variables	Minimum Value	Maximum Value	Mean	Std Error	Std Dev.	Torsion Modulus	Kurtosis Coefficient	Difference Coefficient
<i>Focus Attention</i>	80	89	77.80	1.43	4.21	0.94	3.50	0.05
<i>Attention Flexibility</i>	67	84	80.20	5.33	15.35	-0.99	2.55	0.19
<i>General Attention</i>	47	78	69.00	5.19	8.03	-1.25	2.50	0.12
<i>Processing Speed</i>	80	110	96.00	0.80	2.24	0.24	3.23	0.02
<i>Working Memory</i>	79	117	101.80	1.41	6.06	0.81	-0.89	0.06
<i>Make Decision</i>	76	94	69.86	1.11	3.65	0.88	-2.65	0.05
<i>Emotional Smartness</i>	65	93	79.70	4.34	12.21	-0.67	-2.58	0.15
<i>Cognitive Flexibility</i>	90	87	102.00	2.95	7.71	0.55	-2.52	0.08
<i>Chronological Age</i>	16	26	22.23	1.43	5.32	0.87	2.25	0.24
<i>Training Age</i>	10	14	8.9	1.55	0.89	0.56	2.61	0.10

RESEARCH MAIN PROCEDURES

System processing

By reviewing a set of cognitive skill tests, a comprehensive cognitive and skill performance system was prepared and adopted. A modern system was chosen, which is the comprehensive (HRP) that diagnoses multiple aspects that help in skill and cognitive training and includes a set of tests, which are .

System Components²:

It is an electronic test for several cognitive skills characterized by three main axes, from which the name Lab came from. The attention skill axis was chosen, which contains the following tests, including attention, attention flexibility, information processing test, working memory and decision making, emotional intelligence and cognitive flexibility.

² Zaid Ali Saleh (2022): Preparing a model for cognitive skills according to the battery of mental flexibility and performance (HRP) and its relationship to the level of achievement for young players ranked in table tennis, master's thesis, unpublished, College of Physical Education and Sports Sciences, University of Al-Qadisiyah, p. 28.

The researcher extracted the level of the player as a whole on the tests used, that is, determining the level of each player separately on the combined skills. Each player will apply the tests on the training side prepared by the researcher to know the level of his development or not. Then the tests were applied beforehand before the main experiment to be the actual station to know the extent of the group’s development through the tests or not. As shown in Figure (1) .



Figure (1) A sample of the result of the attention test

Attention Battery

The field of attention consists of three main tests. The duration of the answer must not exceed three minutes. The instructions will be displayed on the screen in front of the laboratory clearly and distinctly, which change periodically. The correct answer is chosen, which is towards the left or towards the right, according to the instructions of the test that requires speed and accuracy. Also, the researcher must obtain 0.75 percent of the correct answers in order to move to the other test. In this test, the results are saved automatically with the rest of the results that the respondent obtains, and they appear in a more detailed manner upon completion of the application of the system.

It consists of three areas:

Attention focus, attention flexibility, general attention.



It is taken into account when applying the examinee that he should take a rest and take care to move away from the constant effort and pressure, and that he be psychologically in a good mood and stay away from the test in case the player feels that there is physical pain or feels that he is not feeling well. It is not possible for another person to interfere with the answer or help when applying the test, and it is preferable that he be alone and has a new desire to perform the program. After completion, the system displays the results in front of the laboratory.



Figure (2) Attention tests

Cognitive Processing Speed

Dealing with cognitive information is an important boundary and an indicator to determine the slowness or speed of the information processor by the subject, and whenever there is a slowdown, there is less chance of the player moving to other tests if he is not qualified. For a training session for a short time, a model with a short hook, either on the left or on the right, we press the f (left) or L (right) key, according to the side on which the short arm appeared. It does not focus on the length of the decision-making period, but the result appears in the form of a raw value and percentages on the taskbar.



Figure (3) Processing speed test

Working Memory

It is the momentary stored information that is well retrieved, so it can be called instantaneous memory, and it is known that remembering is affected by the level of intelligence of the individual, and any person who has a memory that works in a low way is reflected in his performance, as he has a low level of mental operations, they have a memory below the level, and this is evident from Through the mental processes constituting memory activity, on the contrary, we find that intelligent individuals have memory above the level.

This test consists of several parts, including a may that contains a rectangle that contains inserted thank you, which are shaded with a specific color and in different centers. During the application, you have to locate the squares sequentially after you press continue to move you to the next part. The test takes 10 minutes, provided that there are no teaching attempts. Before the application begins, there is another part of the test that shows you a number of symmetrical and different shapes. You have to neutralize the similar shapes and press continue to move to the last part of the test, which combines the importance of the previous two parts by showing a colored square, symmetrical or asymmetrical, then a colored square on the other side

As for the tests, which are (decision making - emotional intelligence - cognitive flexibility - mental health), their application will be similar to the electronic questionnaire, i.e. it includes specific questions with appropriate keys that are suitable for the examined person in terms of age and level. That is, as shown in the figure below::

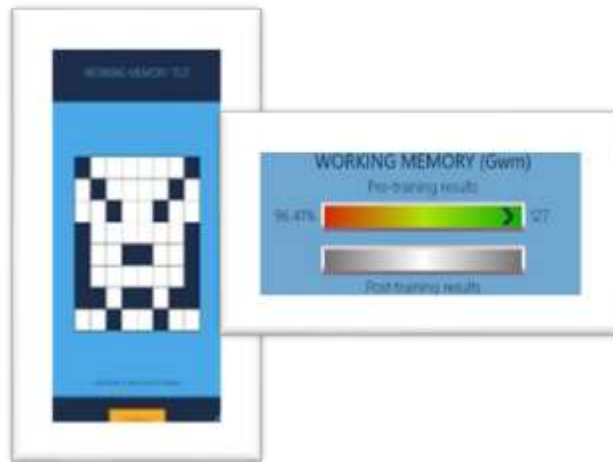


Figure (4) Working Memory Test Results

Making Decision

This test is a set of 13 questions with five correction keys. The examinee chooses one of them after completion. The value taken by the examinee appears in front of him on the screen in the form of raw degrees and percentages. This test is not bound by a specific time for the answer.

Decision Making Test

I feel like my life is far reaching and I am totally committed to it
I firmly refuse
not agree
I do not reject nor agree
I agree
I totally agree

Figure (5) Translated answer alternatives to test decision making

Emotional Intelligence

This test is a set of 12 questions with five correction keys. The examinee chooses one of them after completion. The value taken by the examinee appears in front of him on the screen in the form of raw degrees and percentages. This test is not bound by a specific time for the answer.



Figure (6) Emotional Intelligence Test

Cognitive Flexibility

It consists of 10 paragraphs. Each paragraph contains 5 answer alternatives. The tester answers one of them. After completing the responses, the result appears finally at the end of the axis. The result can be obtained in the form of a colored bar that contains the raw score and the percentage of the correct answer. It is not limited by a special time for the test.



Figure (7) Cognitive flexibility test and its results

Cognitive flexibility test

**Cognitively, stress helps
me think, make
decisions, solve
problems, and learning.
not agree
I strongly disagree**

Figure (8) Answering alternatives for the test of cognitive flexibility

Preparing A Training Curriculum

The researcher prepared a training curriculum for the experimental and control groups, so the experimental group applied the curriculum consisting of 16 training units distributed over six weeks, each week three units. The time of the training unit is 60 minutes. The player trains on only one of the variables, the Cognitive Flexibility Battery (HRP). If each player evaluates 10 minutes of training, then a 5-minute break, followed by another 10 minutes of training on the same variable, after working on the actual training on the playing table by 20 continuous minutes as indicated in Appendix (1). As for the control group, it applied the educational training curriculum prepared without the need for training on the cognitive flexibility system. The Main Experiment

Pre-Tests

The researcher, with the assistant work team, conducted the main experiment, which lasted two days corresponding to 13-14/2/2021, as on the first day, tests were conducted for the players (the experimental group) in the hall of the National Center for Sports Talent in the Ministry of Youth and Sports in Diwaniyah, as it is the place for training. their own

After completing the experiment, the researcher resorted to applying the tests to all the players in the next day in the same hall and to the control group, as the researcher prepared the place and opened the program interface in the computers, and then explained the mechanism of the tests and how to apply them by the players and with indirect supervision to prevent any confusion. Or a state of lack of focus, which affects the accuracy of the desired results, and after

completion, the results were stored and withdrawn on paper, in order to then deal with them statistically.

Post-Tests

After completing the application of the curriculum, the researcher conducted the main experiment and the post tests, which he limited to days 16-17/4/2021, as on the first day, the tests were conducted for the players of the experimental group in the hall of the National Center for the Nurturing of Sports Talent in the Ministry of Youth and Sports in Diwaniyah, as it is the place of training. On the second day, tests were conducted on each of the players (the control group) in a hall on the same hall.

The Statistical Methods Used: The results of the research were extracted based on the SPSS statistical bag.

RESEARCH RESULTS

After the end of the period of applying the training educational curriculum and conducting post-tests, the researchers resorted to analyzing and interpreting the results of their research according to the hypotheses set as follows:

1. In order to answer the hypothesis, which states that "there is a statistically significant difference between the mean of the scores of the pre and post test of the experimental group in the system performance (HRP) test for first-class table tennis players. The researcher extracted the results of the group, tabulated and analyzed them as shown in the table (2).

Table (2) Arithmetic Mean And T-Value Calculated for The Experimental Group in The Selected Variables

Group	Tests	Application	Mean	Std Dev.	T-Value	Sig.
Experimental Group	<i>Attention Focus</i>	Pre-test	77.80	4.21	5.34	0.000
		Post-Test	77.80	4.21		
	<i>Attention Flexibility</i>	Pre-test	87.45	3.43	3.56	0.043
		Post-Test	80.20	15.35		
	<i>General Attention</i>	Pre-test	83.53	10.32	6.28	0.000
		Post-Test	69.00	8.03		
	<i>Processing Speed</i>	Pre-test	85.34	6.12	1.90	0.094
		Post-Test	96.00	2.24		
	<i>Working Memory</i>	Pre-test	97.49	3.33	2.09	0.066
		Post-Test	101.80	6.06		
	<i>Make Decision</i>	Pre-test	99.43	5.45	4.95	0.012
		Post-Test	69.86	3.65		
	<i>Emotional Smartness</i>	Pre-test	75.32	2.67	1.93	0.076

		Post-Test	79.70	12.21		
	<i>Cognitive Flexibility</i>	Pre-test	80.44	10.43	4.87	0.010
		Post-Test	102.00	7.71		

Table (2) shows that there are differences that appeared in the pre-tests for the variables (attention focus, attention flexibility, general attention, decision-making, and cognitive flexibility) if all the results showed that all calculated (t) values are statistically significant at the level of significance (0.05) in favor of the post-test. The researcher attributes this to these cognitive skills that can develop significantly if an integrated approach is applied with drawn goals. If specialists in psychometric tests see that the performance system (HRP) allows conducting short-time and scientifically valid assessments to determine cognitive levels, perceptual flexibility and performance, this also allows Tests in this system conduct training that takes from a month to a month and a half so that we can notice a change in the cognitive level of the necessary flexibility, "to increase the test scores significantly and compare the pre-test results with the real-time scores to obtain objective measures (Scott, William: 1962)" The results also showed that there were no differences between the pre and post tests of the experimental group in the tests (processing speed, working memory, emotional intelligence) if it showed that all the calculated (t) values are above the error level of 0.05. Variables The researcher attributes this to the fact that the educational training curriculum prepared contains two training units for each of the variables studied in the system. These variables need rather long training periods, that is, more than two training units. If (Mamdouh 2002) sees that working memory can be developed steadily if it is There is a curriculum that contains frequent variables for long periods. To complete the answer to the first hypothesis. The researchers extracted the results of the control group with pre and post-tests and analyzed them as shown in Table (3).

Table (3) The Arithmetic Means and The Calculated T Value for The Control Group in The Selected Variables

Group	Tests	Application	Mean	Std Dev.	T-Value	Sig.
Experimental Group	<i>Attention Focus</i>	Pre-test	67.80	3.12	3.31	0.040
		Post-Test	64.45	3.33		
	<i>Attention Flexibility</i>	Pre-test	79.34	8.48	1.51	0.543
		Post-Test	80.44	4.32		
	<i>General Attention</i>	Pre-test	66.67	4.67	3.28	0.035
		Post-Test	69.99	4.14		
	<i>Processing Speed</i>	Pre-test	90.04	4.2.0	1.44	0.494
		Post-Test	92.36	2.53		
	<i>Working Memory</i>	Pre-test	104.33	5.05	0.09	0.466
		Post-Test	104.84	4.36		
	<i>Make Decision</i>	Pre-test	69.66	4.67	2.05	0.512
		Post-Test	68.39	3.61		
	<i>Emotional Smartness</i>	Pre-test	77.78	5.37	1.33	0.176

		Post-Test	79.45	3.46		
	<i>Cognitive Flexibility</i>	Pre-test	105.30	4.3	0.87	0.410
		Post-Test	106.93	3.34		

From Table (3) it is clear that there are statistically significant differences between the pre and post test for the variables (attention focus, general attention), if all results show that all calculated (t) values are a function at the level of significance (0.05) and in favor of the post test and attributed The researcher refers to the variable of attention from general stimulation and focus, which can develop significantly if an integrated training curriculum with studied goals is prepared for it. If we find that a lot of research has found that if diversification of exercises is used during the training unit, it contributes significantly to developing aspects of attention among the players. While the results showed no differences between the pre and post tests of the control group in the tests (processing speed, working memory, emotional intelligence, attention flexibility, decision making, and cognitive flexibility) if it showed that all the calculated (t) values are above the extreme error level. 0.05. This indicates that there is no development for the group members with these variables. The researcher attributes this to the fact that the educational and training curriculum did not help significantly in developing these variables, despite its reliance on the formal performance of skills. T

2- The second hypothesis, which states that "there are differences between the first-class table tennis players in cognitive skills, according to the battery of mental flexibility and performance (HRP). To answer this hypothesis, the researcher used the regression coefficient to find out the extent of the contribution of the studied variables to the cognitive model of the players of the two groups experimental and control, as shown in Table (4)

.and performance (HRP) for the players of the first degree in table tennis. To answer this hypothesis, the researchers used the regression coefficient to find out the extent of the contribution of the studied variables to the cognitive model of the players of the experimental and control groups, as shown in the table (4).

Table (4) Results of Using the Regression and Contribution Ratios for The Selected Variables

Variables	Pre		Contribution Percentage	Adjusted Contribution	Post		Contribution Percentage	Adjusted Contribution
	Estimated Values	Variance Magnification Coefficient			Estimated Values	Variance Magnification Coefficient		
Constant	26.06	-	-		38.31	-	-	-
Focus attention	0.37	3.31	0.53	0.28	0.31	1.39	0.17	0.17
Attention flexibility	0.27	7.48	0.89	0.79	0.44	1.46	0.59	0.59
general attention	0.19	14.84	0.73	0.53	0.41	1.31	0.37	0.37
Processing speed	0.34	4.83	0.39	0.15	0.72	2.46	0.07	0.07
working memory	0.87	4.90	0.85	0.72	1.25	2.53	0.53	0.53
Make decision	0.54	2.84	0.53	0.28	0.92	0.47	0.17	0.17
emotional smartness	0.18	3.77	0.77	0.59	0.56	1.4	0.42	0.42
Cognitive flexibility	0.98	5.93	0.73	0.53	1.36	3.56	0.37	0.37

Through the above table, a clear comparison appears between the two regression. In the first method, the usual regression was used, which suffers from the rejection of hypotheses. This is evident through the values of the inflation coefficient for the parameters, which ranged between (2.54, 14.48), while the values of the contribution ratios ranged between (0.53, 0.89) and the percentages of The modified contribution is (0.15, 0.79), respectively, as the large difference between them shows the instability of the model and thus the invalidity. This procedure is normal from the point of view of those concerned with psychological variables, since most of the variables are for mental and psychological skills in the above model, and these variables are highly influential in sports that require speed Performing and spanking, such as table tennis, "it expresses the possibility of dealing with more than one external stimulus at one time, and then determining

the optimal response to that stimulus by" linking the old motor program drawn in memory with a new situation during the match that the player has not previously recognized or dealt with.³"

CONCLUSIONS

1. The results resulted in a clear and statistically significant change in the performance of the experimental group in the tests (processing speed, working memory, emotional intelligence) when using the performance system (HRP).
2. There is a change in the level of performance of the deaf and mute table tennis players of the experimental group for the better in the variables of (attention focus, attention flexibility, decision-making, attention flexibility, general attention). Dimensional tests
3. The percentage of the contribution of psychological and cognitive variables to the level of players was uneven between one player and another

RECOMMENDATIONS

1. Relying on the performance system (HRP) in diagnosing some variables for table tennis players
2. Preparing a multi-targeted training curriculum for other groups of people with special needs
3. View the most important international systems that contribute to the diagnosis of physical, mental and personal variables for individuals practicing various sports activities.

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³ Zaid Ali Saleh (2022): a previously mentioned source, p. 79.

Appendix (1) An Educational Training Unit Model for The Experimental Group

Time	Training	Training Explanation	Training Duration	Intensity	Total Period
Introductory section 5 min	Miscellaneous exercises	Jogging + Stretching the Arms + Wrist Exercises + Trunk Exercises	5 minutes	Medium 60-80%	5 minutes
Main Section 50 Minutes	Exercise 1	The Player Learns the Skill of Shifting Attention and Trains It Based on The Exercises of The HRP System.	10 (5 minutes rest)	1 set	15 Min
	Exercise 2	The Player Learns the Skill of Shifting Attention and Trains It Based on Other HRP System Exercises	10 (5 minutes rest)	70%	15 Min
	Exercise 1	Learn To Block the Ball Served by The Opposite Player, Changing the Direction of The Ball Each Time	8 minutes (2 second rest)	1 sets 80%	10 Min.
	Exercise 2	Block The Ball Sent by The Opposite Player of Yellow Color Only, With The Ball Changing Direction Each Time	8 minutes (2 second rest)	3 sets 100%	10 Min
Concluding Section 5 Min	Free play	Open Play	Set open time 5 minutes	3 sets 80%	5 Min