Effectiveness of trainings using some modern tools to improve some physiological variables in swimming

PROF. DR / Reem Mohsen Zulfiqar
PROF. DR / Nadia Rasmi
PROF. DR / Mona Al-Shahad
Researcher / Amira Ahmed Ahmed Ali Abdul Rahman Al-Adawi

Introduction and the Research Problem:

Scientific progress and development in all fields is one of the most important characteristics of the modern era, which prompted many countries to subject all capabilities to scientific research and experimentation, so that they can keep pace with this development by identifying scientific problems to try to find appropriate solutions to them, one of these areas is the field of sports training physiology, which works to develop and improve the physiological efficiency of body systems, thus, improving and developing athletic performance (19)

Swimming is one of the water sports that witnesses a permanent struggle with time in order to achieve better performance and less time, whether swimming competitions or long distances. And that is through several means, whether educational or training, swimming is also an important sporting activity that leads to the fitness and health of the body and raise the efficiency of vital body organs and devices, and by using

various methods and tools that improve the physical and skill level. (2)

Swimming positively affects all parts of the body, as all parts of the body are active, the capillaries expand to supply the common muscles with the blood they need to counter the effort required to be performed. It also increases arterial elasticity, increases the elasticity of the walls of the blood vessels, and increases the number of active capillaries to work efficiently.

It also contributes to increasing the ability of the elasticity of the lungs as a result of the pressure of water on the chest and the contraction and flatness of the muscles surrounding this area as well as regular breathing, all of this increases the elasticity of the lungs and consequently increases the vital capacity, which is a measure of the ability of the respiratory system to supply the body with oxygen during physical exertion. It is one of the most important measurements that indicate the physiological adaptation that occurred as a result of exercising regular sports activity (1:76) (12: 82).

And modern methods of training are mainly based on the development of the physiology of the body in the production of energy needed for the movement of swimmer in the water, without understanding the systems of energy production in the human body, it is difficult to deal with these methods. Physiological studies revealed that the energy requirements in

each race or distance are different from the others, success is achieved by developing the body's ability to provide the required amount of energy as quickly as possible to achieve new records. (20).

Abu El-Ela Abdel-Fattah (2003) notes that the digital progress in swimming is the result of adaptive processes, It is carried out by automated systems inside the human body and its various systems, training is the stress factor that body systems respond to, these responses result in several physical and physical changes that enable him to carry out the requirements of practice in proportion to the required level and efficiency. (3)

Auxiliary tools are an important part of improving swimming performance, the more these tools multiply and the optimal use is used in a timely manner, It pays off for both the coach and the swimmer. It shows the importance of using them to organize and diversify the training unit, It also makes swimmers more focused on faster acquisition of skills, better performance, and time and effort. (4)

Hence, the mathematical training and sport physiology were closely related. Considering that the science of sports physiology is the science that explains the changes and processes performed by the body’s systems, while training is the dynamic performance that causes these changes, with the aim of improving and developing them and reaching the highest levels. (6: 153)

The current study problem was determined by the group of observations that the researcher formed, by virtue of teaching the swimming subject to the fourth year students, it is specialized in swimming and it is summarized as follows:

- Inability to regulate breathing.
- Rapid appearance of fatigue and movement out in a disorganized, disorganized form.
- The lack of performance flow due to the participation of non-working muscle groups to perform the required movements, which negatively affects the level of skill performance.

From the above, the idea of the current research emerged as the researcher considered using some modern tools to enrich the educational process and stimulate the students 'motivation to increase their positive participation and delay the feeling of fatigue, and learn about its effectiveness on some of the physiological variables of female students in swimming.

Research objectives:

This research aims to identify:

The effect of using some modern tools to improve some of the physiological variables of female students in swimming.

Research hypotheses:-

1. There are statistically significant differences between the pre and post measurements of the two research groups

(experimental and control) in some physiological variables in favor of the post measurement.

2. There are statistically significant differences between the two dimensional measurements of the two research groups (experimental and control) in some physiological variables in favor of the post-measurement of the experimental group.
3. There are differences in the improvement ratios between the two dimensional measurements of the two research groups (experimental and control) in some physiological variables in favor of the experimental group.

Research Methodology :

Use the experimental approach designing pre- and post-measurement for two groups (experimental and control), this is because it is appropriate to the nature of the research and to achieve its goals and hypotheses.

Search community:

The research community included students of the fourth year registered in the academic year 2018/2019.

Research sample :

The sample of the research was chosen by the intentional method of the research community the number reached (17) female students (swimming major).The researcher teaches them,(5) students (college team) were excluded for conducting the survey study and (12) students were randomly divided into

two groups (experimental and control) after conducting homogeneity and parity.

The researcher also hired (5) students from the research community and outside the basic research sample to conduct scientific operations (Honesty and consistency) (unmarked group).

Table (1)

Classification of the research sample

The research sample	Number of female students
Experimental group	Student (6)
Control group	Student (6)
Exploratory sample	Student (5)
Total of the research sample	Student (17)

- **Homogeneity:**

The researcher performed the homogeneity of the research sample in the age, height and weight variables, and the physiological variables under investigation, as shown in tables (2).

Table (2)
Statistical characterization of the research community in the variables under investigation

N= 17

Variables	Alone Take a look	The average	Mediator	standard deviation	Coefficient of torsion	Flatness
Anthropometric variables						
Age	Year	162.50	160.00	4.46	0.68	-1.29
Length to	cm	59.76	56.00	7.50	1.40	1.84
the weight	Kg	21.76	22.00	0.44	-1.37	-0.15
Physiological variables						
Vital VC capacity	Mm / liter	102.18	8.90	103.00	0.54	-0.14
Exhale ERV volume	^{3}cm	108.00	33.82	114.00	0.21	-1.04
The size of the IRV inhale	^{3}cm	45.71	35.62	52.00	0.01	-1.76
The normal size of the TV lungs	Ml	127.24	44.91	108.00	1.74	1.81
Inhalation IC density	Ml	104.41	23.33	99.00	-0.24	0.11
Exhalation FEVI size	L / s	104.41	7.45	101.00	1.78	2.23
Inhalation PIF flow	L / s	68.88	11.25	68.00	0.10	0.02
Pressure	Mm / mercury s	100.53	100.00	6.70	0.07	-0.82
The pulse	N / s	85.76	84.00	10.19	0.40	-0.95

Table (2) shows that modulus of convolution of the sample in the tests in question, it was limited between (+3, -3), which indicates the moderate frequency of the variables under consideration.

- **Parity:**

Table (3) shows the equivalence procedure in the physiological variables under discussion.

Table (3)
An indication of the differences between the tribal measurements of the experimental and control groups in some anthropometric and physiological variables.

N = 12

Variables	Tribal measurements	The number of ranks	Average rank	Total ranks	u	Level p indication
						Anthropometric variables -C
Age	Control group	6	6.33	38.00	. 162	.871
	Experimental group	6	6.67	40.00		
the weight	Control group	6	6.08	36.50	.402	688
	Experimental group	6	6.92	41.50		
Length	Control group	6	5.50	33.00	1.483	.138
	Experimental group	6	7.50	45.00		
						variables physiological -D
Vital capacity VC	Control group	6	5.00	30.00	-1.459	.145
	Experimental group	6	8.00	48.00		
Exhale volume ERV	Control group	6	5.58	33.50	-885	.376
	Experimental group	6	7.42	44.50		
The size of the inhaleIRV	Control group	6	7.08	42.50	574	.566
	Experimental group	6	5.92	35.50		
The normal size of the lungsTV	Control group	6	7.75	46.50	-1.245	.213
	Experimental group	6	5.25	31.50		
Inhalation densityIC	Control group	6	7.33	44.00	-805	.421
	Experimental group	6	5.67	34.00		
Exhalation sizeFEVI	Control group	6	6.08	36.50	-405	685
	Experimental group	6	6.92	41.50		
	Control group	6	7.00	42.00	492	.623

Inhalation flowPIF	Experimental group	6	6.00	36.00		
systolic Pressure	Control group	6	6.17	37.00	- 325	.818
	Experimental group	6	6.83	41.00		
diastolic Pressure	Control group	6	5.25	31.50	1.209	.240
	Experimental group	6	7.75	46.50		
The pulse	Control group	6	7.67	46.00	- 1.121	.310
	Experimental group	6	5.33	32.00		

Table (T) value at the level of significance 0.5 and freedom degree 10 = 1.812

It is clear from Table (3) that there are no statistically significant differences between the experimental group and the control group in the tribal measurements, which indicates the equivalence of the two groups in some anthropometric and physiological variables.

- **Data collection tools and means:**

To collect data and information, the researcher used the following:

1. **Scientific references, research, related studies and information network:**

The researcher reviewed the scientific references, related studies and the information network in the field of study to know how to conduct the current study.

2. **Personal interviews and expert opinion poll:**

The researcher conducted several personal interviews with a number of professors working in the fields of swimming in order to determine:

- The most suitable exercises used.
- Physiological variables to be measured.

Questionnaire:

- Survey questionnaire for professors working in the field of study.
- A special data registration form for each student prepared by the researcher.

Tools and measuring devices:

- Restimeter for measuring length (cm).
- Medical scale for measuring weight (kg).
- Aspirometer for measuring vital capacity and pulmonary volumes (3 cm).
- Digital pressure and pulse meter (mm / Hg) (n / s).

Tools for the skilled side:

Floating bar - Stop Watch – Hydro Hip - Parachute - poster Trainer (Breathe tool) – Tech Tok - Snorkel - Fins - Hand Paddel - Camera - Different Weights - Asiatic.

Scientific coefficients for the exams under consideration:

A- Test Validity:

To calculate the sincerity of the tests, the researcher used the validity of the hypothesis formation by the differences between the groups, by applying the tests to two different groups of college students, the advantages and the non-characteristics, and they are (5) students from the research community and outside the basic sample, then comparing the significance of the mean differences between the two groups to identify honesty Tests in identifying the differences between the two groups on 3/10/2018 and table (16) illustrates this:

Table(4)
Indication of differences between the average grade group characteristic and distinctive in the level of Physiological variables under investigation
(N1 = n2 = 5)

variables Physiological	Groups	The number of ranks	Average rank	Total ranks	u	level p indication
Vital capacity VC	Featured group	5 5	3.00	15.00	* 2.660	.008
	Unmarked group		8.00	40.00		
Exhale volume ERV	Featured group	5 5	3.00	15.00	* 2.694	.007
	Unmarked group		8.00	40.00		
The size of the inhaleIRV	Featured group	5 5	3.00	15.00	* 2.703	.007
	Unmarked group		8.00	40.00		
The normal size of the lungsTV	Featured group	5 5	3.20	16.00	* 2.487	.013
	Unmarked group		7.80	39.00		
Inhalation densityIC	Featured group	5 5	7.70	38.50	* 2.378	.017
	Unmarked group		3.30	16.50		
Exhalation sizeFEVI	Featured group	5 5	3.00	15.00	* 2.635	.008

	Unmarked group		8.00	40.00		
Inhalation flowPIF	**Featured group**	5 5	3.00	15.00	* 2.652	.008
	Unmarked group		8.00	40.00		

From Table (4), it is clear that:

That there are differences statistically significant differences between the average ranks of the distinct and non-distinctive group scores in the level of performance of the physiological variables (under research), and these differences in the direction of the distinct group and this indicates the ability of the tests used to distinguish between the different levels, which indicates that they are at an acceptable degree of honesty .

B- Stability of physiological tests:

To verify the stability of physical tests, the researcher used the method of applying the test and re-applying the Test Re Test to the truth sample and used its data as the first application for stability on 9/26/2018 and the second application after seven days of the first application on 3/10/2018 and this is explained

Table (5)

Correlation coefficient between the first and second applications in the variables

Physiological under investigation **n = 5**

variables Physiological	**The first application**		**The second application**		**Value " t " of**	**Sig**
	M	**P**	**M**	P		
Vital capacity VC	98.80	5.50	99.00	5.10	1999	.000
Exhale volume ERV	100.80	37.67	101.00	37.56	1,000	.000
The size of the inhale IRV	44.40	37.42	44.60	37.47	1,000	.000

The normal size of the lungs TV	133.20	55.02	133.00	55.14	1,000	.000
Inhalation density IC	98.20	24.77	96.40	23.92	.987	.002
Exhalation size FEVI	101.20	2.28	101.00	2.35	.982	.003
Inhalation flow PIF	69.60	13.90	67.80	17.38	.992	.001

* Attachment "r" value at the level of 0.05 = 0.811

It is clear from Table (5) that the correlation coefficients between the first and second application of physiological tests ranged between (0.961 and 0.998), which indicates that they have high coefficients of stability.

Executive steps of the research:

After defining the community and sample of the research, and interviewing some of the experts specialized in swimming sport, the researcher did the following: -

- ✓ **Survey study:**

After completing the amendments referred to by the experts, the researcher conducted a survey study on Tuesday 25/9/2018 on the survey sample of (5) students from the research community and outside the basic sample, in order to ensure the validity of the tools used and how to use them , And the appropriateness of the content of the training exercises used and the extent of the students' response to them, and identifying any difficulties that might be encountered and how to overcome them. As well as training aid on how to use the tools.

✓ **Tribal measurement**

The pre-measurement of the two research groups was carried out on Wednesday 3/10/2018 at the Sports Medicine Center near Cairo Stadium in Nasr City and the results were recorded in the special forms for the individuals of the sample to be treated statistically.

✓ **Study application:**

After confirming the validity of the tools and their suitability for female students as well as the occasion of the exercises, training doses were implemented in the swimming pool at the Faculty of Physical Education in the island for a period of (10) weeks in the period of time from 08/10/2018 to 13/12/2018 at (3) doses per week and the time of one dose (90) minutes. And for the experimental and control groups, on Mondays, Tuesday and Thursday of each week. Where the training doses were applied to the experimental group using modern aids, while the control group used the same training doses for the experimental group, but without the use of tools. It also took into account that the performance of the two groups under the same circumstances and at the same time.

- **Dimensional measurements:**

Dimensional measurements of the two research groups were carried out immediately after the completion of the application of the training used on Wednesday 19/12/2018 at the Sports

Medicine Center next to Cairo Stadium in Nasr City. The results were recorded in the special forms for the individuals of the sample to be treated statistically.

- **Statistical treatments:**

The statistical analysis plan included the use of the following statistical methods:

- Mediator.
- Arithmetic average.
- Standard deviation.
- The significance of the differences (T) Test.
- Improvement ratios (%).
- Convolution coefficient.
- Flatulence.
- Lexus equation.
- Mann and Tiny equation.

Presentation and discussion of the results:

Results:

In light of the research objectives and hypotheses and within the limits of the research sample and based on statistical treatments, the results were presented in tables from Table (6) to Table (11).

Table (6)
Arithmetic averages and standard deviations
of the control group between tribal measurements
And dimensional in some physiological variables

N = 6

Physiological variables	measurements Tribal		measurements Dimensional	
	M	P	M	P
VC Vital capacity	107.33	8.41	111.83	8.50
Exhale volume ERV	118.67	33.71	136.83	27.93
The size of the inhaleIRV	39.50	35.56	58.33	26.49
The normal size of TV the lungs	115.67	36.89	166.67	8.16
Inhalation densityIC	101.33	30.00	97.33	27.83
Exhalation FEVI size	106.83	8.93	110.17	9.85
Inhalation PIF flow	68.50	9.46	75.33	7.34
systolic Pressure	105.00	5.44	97.83	4.45
diastolic Pressure	68.83	4.88	66.0	3.85
z Pulse	89.83	11.05	96.50	8.04

Table (6) shows the mean and standard deviations between the pre and post measurements of the control group in some physiological variables.

Table (7)
An indication of the differences between the pre and post measurements of the control group in
Physiological variables under investigation

N= 6

variables Physiological	Signal direction	The number of ranks	Average rank	Total ranks	Valuesz	Significanc p level
Vital capacity VC	-	0	.00	.00	* 2.032	.042
	+	5	3.00	15.00		
	=	1				

Exhale volume ERV	-	0	.00	.00	* 2.201	.028
	+	6	3.50	21.00		
	=	0				
The size of the inhaleIRV	-	0	.00	.00	* 2.032	.042
	+	5	3.00	15.00		
	=	1				
The normal size TinTV I .R of	-	1	1.00	1.00	* 2.003	.045
	+	5	4.00	20.00		
	=	0				
Inhalation densityIC	-	6	3.50	21.00	* 2.226	.026
	+	0	.00	.00		
	=	0				
FEVI Exhalation size	-	0	.00	.00	2.032	.042
	+	5	3.00	15.00		
	=	1				
Inhalation flowPIF	-	0	.00	.00	* 2.214	.027
	+	6	3.50	21.00		
	=	0				
systolic Pressure	-	6	3.50	21.00	* 2.201	.028
	+	0	.00	.00		
	=	0				
diastolic Pressure	-	6	3.50	21.00	* 2.214	.027
	+	0	.00	.00		
	=	0				
The pulse	-	2	1.50	3.00	1.214	. 225
	+	3	4.00	12.00		
	=	1				

It is seen from the table (7)there are statistically significant differences between the pre and post measurements of the control group in the physiological variables under investigation,

Using the Wilkinson Labarometer test,the significance level ranged between (0.027 -0.045), which are lower than the 0.05 significance level that the researcher accepted, as a condition for accepting the differences, therefore, the differences were accepted in favor of the program's dimensional measurement, and the absence of statistically significant differences in the pulse.

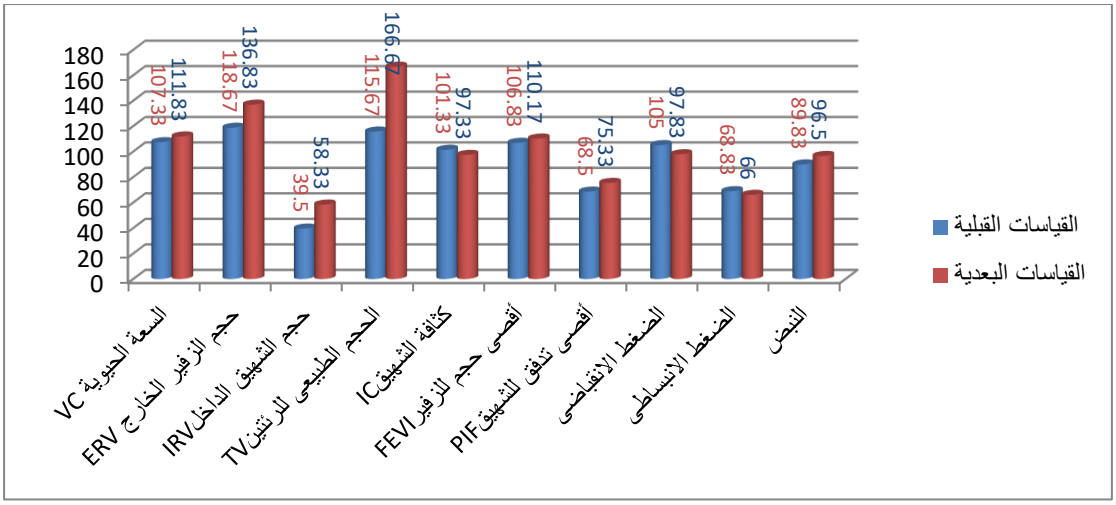

Figure (1) shows the significance of the differences between the pre and post measurements of the control group physiological variables under consideration

Table (8)
Arithmetic averages and standard deviations for the experimental group between measurements Tribal and dimensional in some physiological variables
N = 6

Physiological variables	measurements Tribal		measurements Dimensional	
	M	P	M	P
VC Vital capacity	99.83	10.42	128.67	1.03
Exhale ERV volume	103.33	34.26	173.83	22.54
The size of the IRV inhale	53.00	39.55	121.33	16.52
The normal size of TV the lungs	133.83	49.24	216.17	25.49
Inhalation densityIC	112.67	14.80	69.67	5.68
Exhalation FEVI size	104.67	8.73	125.50	11.24
Inhalation PIF flow	68.67	12.64	94.00	5.73
systolic Pressure	104.167	6.30608	89.50	6.655
diastolic Pressure	65.5000	4.54973	58.50	5.50
The pulse	97.5000	10.59717	84.33	6.713

Table (8) shows the mean and standard deviations of the experimental group between the pre and post measurements in some physiological variables.

Table (9)
An indication of the differences between the pre and post measurements of the experimental group In physiological variables under consideration

N = 6

variables Physiological	Signal direction	The number of ranks	Average rank	Total ranks	z Values	Significanc p level
Vital capacity VC	-	0	.00	.00	* 2.207	.027
	+	6	3.50	21.00		
	=	0				
Exhale volume ERV	-	0	.00	.00	* 2.201	.028
	+	6	3.50	21.00		
	=	0				
The size of the IRV inhale	-	0	.00	.00	* 2.201	.028
	+	6	3.50	21.00		
	=	0				
The normal size of the TV lungs	-	0	.00	.00	* 2.201	.028
	+	6	3.50	21.00		
	=	0				
IC Inhalation density	-	6	3.50	21.00	* 2.201	.028
	+	0	.00	.00		
	=	0				
FEVI Exhalation size	-	0	.00	.00	* 2.201	.028
	+	6	3.50	21.00		
	=	0				
PIF Inhalation flow	-	0	.00	.00	* 2.207	.027
	+	6	3.50	21.00		
	=	0				
systolic Pressure	-	6	3.50	21.00	* 2.201	.028
	+	0	.00	.00		
	=	0				
diastolic Pressure	-	6	3.50	21.00	* 2.201	.028
	+	0	.00	.00		
	=	0				
	-	5	4.00	20.00	* 1.992	.046

The pulse	+	1	1.00	1.00		
	=	0				

It is seen from the table (9)the presence of statistically significant differences between the pre and post measurements of the experimental group in the physiological variables under investigation, using the Wilcoxon Labarometric test, and the level of significance ranged (0.028 - 0.027), which are levels below the significance level of 0.05 that the researcher required as a condition for accepting the differences, so the differences were accepted in favor of the dimensional measurement For the program.

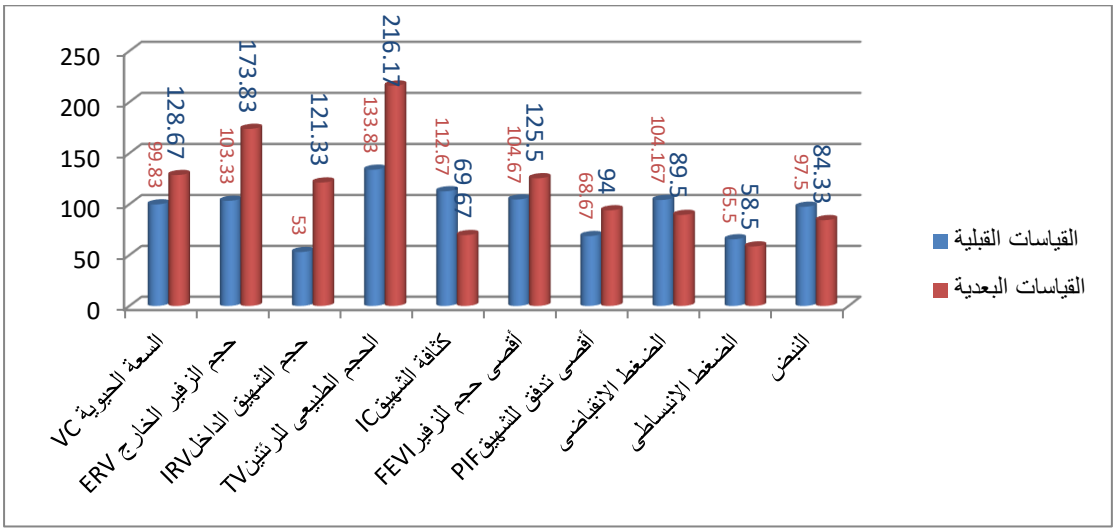

Figure (2) shows the significance of the differences between the pre and post measurements of the experimental group of the physiological variables under consideration.

Table (10)
An indication of the differences between the dimensional measurements of the experimental and control groups In some physiological variables

N = 12

variables Physiological	measurements Dimensional	The number of ranks	Average rank	Total ranks	u	level p indicatio
Vital capacity VC	Control group	6	9.50	57.00	2.950*	.003
	Experimental group	6	3.50	21.00		
Exhale volume ERV	Control group	6	8.67	52.00	2.093*	.036
	Experimental group	6	4.33	26.00		
The size of the inhale IRV	Control group	6	9.33	56.00	2.791*	.005
	Experimental group	6	3.67	22.00		
The normal size of TV lungs the	Control group	6	9.08	54.50	2.676*	.007
	Experimental group	6	3.92	23.50		
Inhalation density IC	Control group	6	4.50	27.00	1.960*	.050
	Experimental group	6	8.50	51.00		
FEVI Exhalation size	Control group	6	8.75	52.50	2.185*	.029
	Experimental group	6	4.25	25.50		
PIF Inhalation flow	Control group	6	9.33	56.00	2.761*	.006
	Experimental group	6	3.67	22.00		
systolic Pressure	Control group	6	4.33	26.00	* 2.082	.041
	Experimental group	6	8.67	52.00		
diastolic Pressure	Control group	6	4.25	25.50	* 2.169	.026
	Experimental group	6	8.75	52.50		
The pulse	Control group	6	4.33	26.00	- 2.085	.041
	Experimental group	6	8.67	52.00		

Table (T) value at the level of significance 0.5 and freedom degree 10 = 1.812

Seen from the table (10)there are statistically significant differences between the experimental group and the control group in the dimensional measurements in some physiological variables

under consideration in favor of the dimensional measurements of the experimental group.

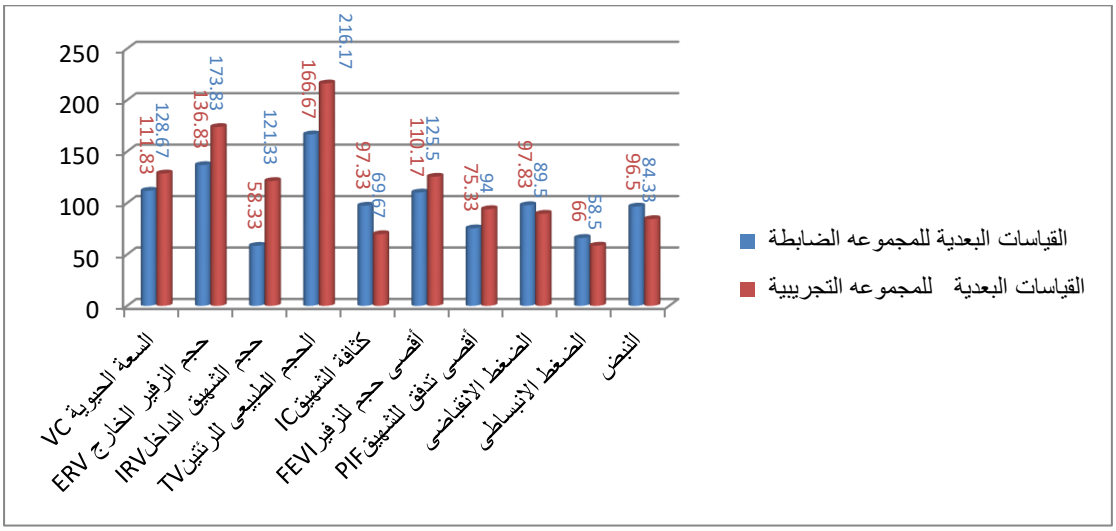

Figure (3) shows the significance of the differences between the two dimensions of the two experimental groups control of physiological variables under investigation

Table (11)
Percentages of the rates of change of the dimensional measurements from the tribalities of the control and experimental groupsIn some physiological variables under consideration

N = 12

Physiological variables	A group control		Dimensional percentages from tribal	A group trial		Dimensional percentag Fromtribal
	Tribal	Dimensional	%	Tribal	Dimensional	%
Vital capacity VC	107.33	111.83	4.19%	99.83	128.67	8.88%
Exhale volume ERV	118.67	136.83	15.31%	103.33	173.83	68.23%
The size of the inhale IRV	39.50	58.33	47.68%	53.00	121.33	128.93%
The normal size of the lungs TV	115.67	166.67	44.09%	133.83	216.17	61.52%
Inhalation density IC	101.33	97.33	3.95%	112.67	69.67	38.17%
Exhalation size FEVI	106.83	110.17	3.12%	104.67	125.50	19.90%
Inhalation flow PIF	68.50	75.33	9.98%	68.67	94.00	36.89%

systolic Pressure	105.00	97.83	6.83%	104.17	89.50	14.08%
diastolic Pressure	68.83	66.00	4.12%	65.50	58.50	10.69%
The pulse	89.83	96.50	7.42%	103.00	84.33	18.12%

Show from table (11)the percentages of the rates of changes in the dimensions of the tribal for the control and experimental groups in favor of the dimensional measurement of the experimental group in some physiological variables.

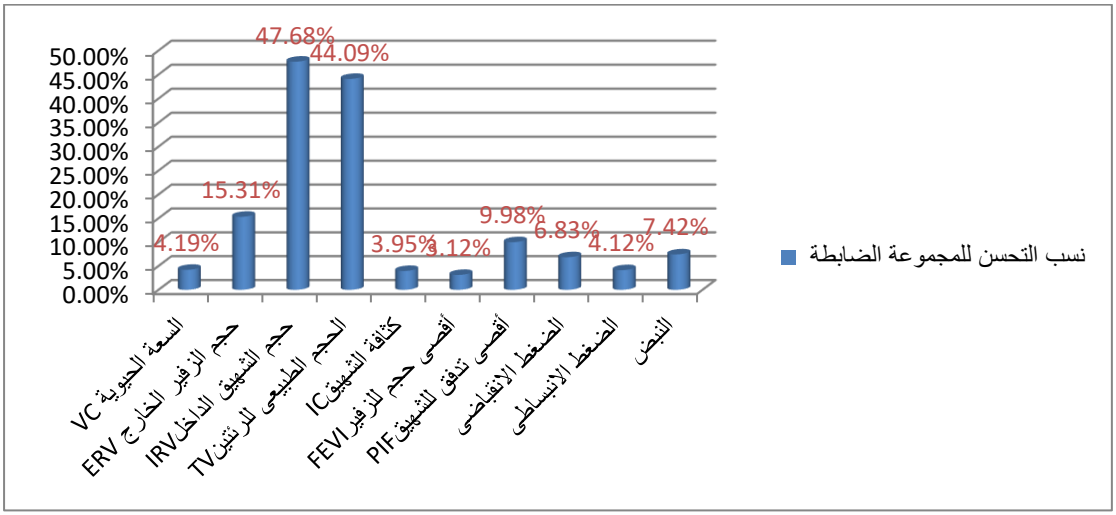

Figure (4) shows the percentages of improvement between the pre and post measurements of the group control of physiological variables under investigation

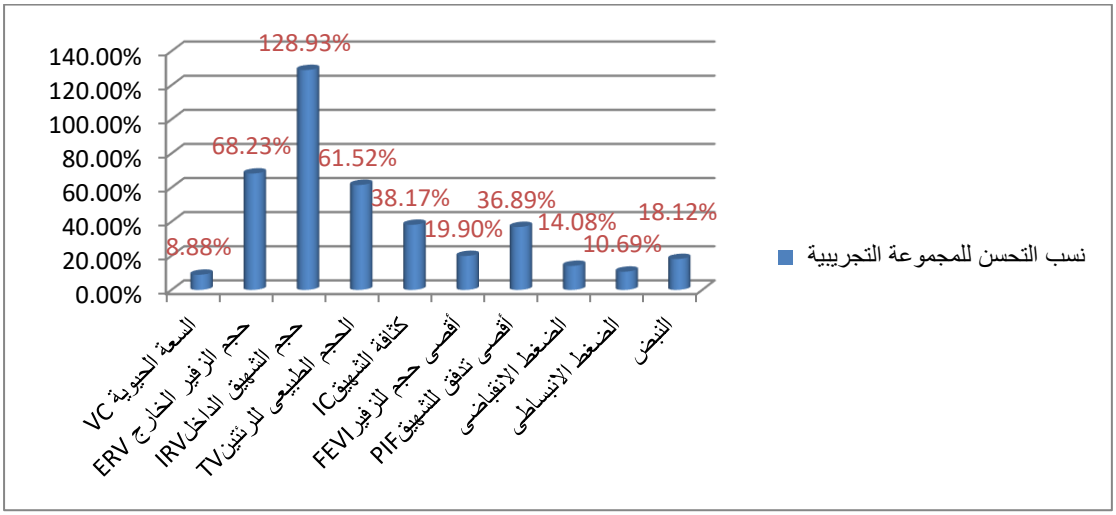

Figure (5) shows the percentage of improvement between the pre and post measurements of the experimental group physiological variables under consideration

Discuss the results:

Depending on the results that were reached and statistically processed,the researcher presented, interpreted and discussed the results according to the research objectives and hypotheses.

A review of the results of Table (6) and (7) and Figure (1) shows the presence of statistically significant differences at the level of significance <0.05 between the pre and post measurements in the physiological variables under investigation in favor of the dimensional measurement of the control group,

The significance level for most physiological variables used in the research ranged between (0.027 - 0.045), which are levels less than the 0.05 significance level that the researcher accepted as a condition for accepting the differences, which confirms that there are statistically significant differences between the pre and post measurements in most of the physiological variables under investigation in favor of telemetry For the control group. It is also clear that there are no statistically significant differences in the pulse, as it obtained a level greater than the 0.05 significance level that the researcher accepted, as a condition for accepting the differences, which is 0.225.

The researcher believes that the percentage of change to the measurements of the distance from the tribalism in measuring some physiological variables under investigation by the control group is due to those exercises that were used in the program followed by the college used by the control group.As well as to the effort made by faculty members with female students during the lectures,likewise, the students ’keenness to attend regular lectures and not be absent from the lecture,where they had a positive impact on improving the level of some physiological variables, which subsequently led to an improvement in the physical condition of students, which was already reflected on the level of skill and time performance of swimming (crawling, back, and chest)as well as improving the number of offers in measuring endurance.

A review of the results of Table (8) and (9) and Figure (2) shows a statistically significant difference at the level of significance <0.05 between the pre and post measurements in the physiological variables under investigation in favor of the dimensional measurement of the experimental group, the significance level for all physiological variables used in the research ranged between (0.027 - 0.028), which are levels below the significance level of 0.05 that the researcher accepted as a condition for accepting the differences, which confirms the presence of statistically significant differences between the pre and post measurements in the physiological variables under

investigation in favor of the dimensional measurement of the experimental group.

The researcher believes that the percentage of change to the measurements of distance from tribalism in the measurement of physiological variables under investigation by the experimental group is due to the students 'keenness to attend regularly the lectures and not to miss the lectureas well as the exercises and exercises used in the proposed training program using modern auxiliary tools, as they had a positive impact on improving the level of physiological changes, which subsequently led to an improvement in the physical condition of students, which was already reflected at the level of skill and time performance,this was agreed upon by Essam Abdel-Khalek (2005),Mahmoud Abdel Mohsen Nagy (2017), Mohamed El-Kerdany and others (2014), Wagdy Mostafa El-Fateh (2014), Hany El-Desouky (2013), Aboul Ela Abdel-Fattah and Hazem Salem (2011), IbtisamTawfiq et al. (2008), Nabila Labib and others (2007)).

The results of the study of Abeer Gamal Shehata (2017) and Wafaa Adel Abdul-Hadi (2017) confirmed that the auxiliary tools that are used have an important and effective role in the positive impact on the physiological aspect. (8) (17)

Thus, the first hypothesis, which stipulates:

First hypothesis: There are statistically significant differences between the pre and post measurements of the two research

groups (experimental and control) in some physiological variables in favor of the post measurement.

A review of the results of Table (10), (11), and Figure (3), (4) and (5) shows the presence of statistically significant differences between the two research groups in some physiological variables under investigation in favor of the dimensional measurements of the experimental group where the value of the (T) tabular at the level of significance 0.05 and the degree of freedom 10 = 1.812, and the calculated "T" values came above the tabular value, and this is confirmed by the difference between them in the percentages of the change rates, where the percentages of the rates of changes in the dimensions of the tribalism in the physiological variables under consideration for the control and experimental group respectively for the capacity Vitality (4.19% - 8.88%), with a difference between the change rates reached (4.69%), and the percentages of change rates for the volume of exhalation exits for the control and experimental groups respectively (15.31% - 68.23%), with a difference between the change rates reached (52.92%) The percentage of change rates for the volume of inhalation in the control and experimental groups, respectively (47.68% - 128.93%), with a difference between the change rates reached (81.25%), and the percentage of change rates for the normal size of the lungs of the control and experimental groups respectively (44.09%) - 61.52%), with a difference Between the change rates reached (17.43%), while the percentages of the

change rates for the inspiration intensity of the control and experimental groups respectively (3.95% - 38.17%), with a difference between the change rates reached (34.22%), and the percentages of the change rates for the maximum volume of expiration for the two groups Control and experimental respectively (3.12% - 19.90%), with a difference between the change rates reached (16.78%), and the percentages of change rates for the maximum inhalation flow for the two groups were controlled and experimental respectively (9.98% - 36.89%), with a difference between the change rates reached (The percentage of change rates of systolic pressure for the control and experimental groups respectively (6.83% - 14.08%), with a difference between the change rates reached (7.25%), while the percentages of the rates of change for the diastolic pressure of the control and experimental groups respectively (4.12) % - 10.69%), with a difference between the change rates reached (6.57%), and the percentage of pulse change rates for the control and experimental groups, respectively (7.42% - 18.12%), with a difference between the change rates reached (10.7%).

The researcher attributes the improvement in some of the physiological variables of the control group that used the method used in swimming lessons (explanation, model presentation, and error correction) to the regularity of female students in swimming lessons and their desire to learn, as well as to the effort exerted by faculty members in lectures to try to perform the latest exercises

that help female students To improve their skill level, physical and physiological level.

The researcher attributed these differences and the improvement in the physiological variables under investigation in favor of the dimensional measurement of the experimental group to the proposed training program using modern auxiliary tools where the improvement of the pulse rate as a result of the improvement of the heart muscle and the increase in the amount of blood paid in one pulse and thus an improvement in the level of physiological efficiency of the students, and an improvement The vital capacity is due to the improvement of the work of the respiratory system as a result of an increase in the elasticity and size of the lungs. The improvement of physiological variables led to an increase in the job efficiency and the training status of female students. Both Abu Al-Ella Abdel-Fattah (2003) and Baha Salama (2000) agree that sports training leads to a decrease In the pulse rate during the rest period and the speed of the heart returning to its normal state after exertion. (3) (5)

Weining et al (2007) indicates that the heartbeat is one of the most important indicators that reflect the intensity of training for athletes and physiological pregnancy in multiple stages of endurance sports, the heartbeat will change significantly as the intensity of training and the training and physiological state of swimmers change. (22)

The results of the research are consistent with the study of Wafaa Adel Abdel-Hadi (2017), Teba, A., and Aellano (2015), where their results indicated a change in cardiac functions during physical exertion in general, and in swimming in particular. (17) (21)

In this regard, Sobhi Al-Galali (2001) states that the level of performance is influenced by a group of physiological and morphological factors, but the physiological factors are at the forefront of those factors affecting the physical level and consequently the skill level. (7:17)

Issam Abdel-Khalek (2005) also states that sports training causes various physiological changes that include all body systems, and the more these changes are positive, the more advanced the level of sports performance. (195: 9)

The researcher believes that there are statistically significant differences between the two measures of the two measures of the experimental and control groups and the differences in the improvement ratios in favor of the dimensional measurement of the experimental group in all the variables under discussion to the effect of the training used in the proposed training program using modern assistive tools where the researcher took into account when designing precision and comprehensive training and that There will be change and diversification as well as taking into account the correct scientific foundations in the implementation

and evaluation of the proposed training program in proportion to the conditions, capabilities and requirements of training for the research sample, which led to a positive impact on all physiological and physical variables and the skill level

It appears from the current studythere is a strong correlation between the improvement of physiological variables, the improvement of physical abilities, and the level of skill performance, as they affect each other and one of them causes the other to improve.

Thus, the validity of the second and third hypotheses, which stipulate:

Second Hypothesis: There are statistically significant differences between the two dimensional measurements of the two research groups (experimental and control) in some physiological variables in favor of the post-measurement of the experimental group.

Third Hypothesis: There are differences in the improvement rates between the two dimensional measurements of the two research groups (experimental and control) in some physiological variables in favor of the experimental group.

Conclusions:

- The proposed training using modern tools has a positive effect on the development of physiological responses to the variables under consideration,where there are statistically

significant differences between the two research groups in the dimensional measurement in favor of the experimental group.

- There are differences in the improvement rates between the two dimensional measures of the two research groups (experimental and control) in the physiological responses of the variables under investigation in favor of the experimental group.

Recommendations:

- The use of training using modern tools on similar samples because they have an effective impact on improving the physiological responses of the members of the research sample.
- Conducting more research and similar studies to raise the level of efficiency of vital devices.

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