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The Effectiveness of a Suggested Qualitative Training Program on Some Physiological Responses and Skillful Variables for 17 Years Old Football Juniors.

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Abstract

This research aims to investigate the effectiveness of a suggested qualitative training program on some physiological responses and skillful variables for 17 old-football juniors through examining the effectiveness of the suggested qualitative training program on some physiological responses and the skillful variables for 17 old-football juniors. Another purpose of this research is to examine the rate of progress of some physiological responses and some in question skillful variables for under 17 years –old junior footballers.

The researcher used the experimental method as it suited for the content and procedures of the research through which he used the experimental design of one- experimental group (pre and post tests.

The population study represents (87) junior football players of (4) clubs under the age of 17 at El-baha district that are (El-baha,El-ameed, Al-seraah and Al-tasamouh) clubs in the Kingdom of Saudi Arabia.these clubs are registered in the records of Football Saudian union in the current season 1433 -1434 H. The researcher selected the research sample using deliberate method from17- years old junior-football players at El-tasamouh sport club, Al-Qunfudah Governerate. The sample size was (18) junior players in addition to the survey research sample which were (8) junior players bringing the total sample (26) junior players. The researcher conducted and examined the homogeneity of the research sample in the in questioned- variables to ensure its normal distribution curve.

The researcher used the following physiological measurements to collect data as follows: heart rate (FH), maximal oxygen consumption (VO2), volume of ventilation(VE-ED), Respiratory fitness variable (Mets), and the following skilful tests as : Wind run with a ball, internal facet of foot, kicking the ball with the external facet of foot, trap the ball with the front facet of the foot, chest trap, fix the ball under foot, Kicking the ball with head from a fixed position.

One of the prominent results is that the suggested qualitative training program has a positive effect with a statistical significance on the development of physiological responses and developing the level of skilful performance of research sample of football juniors under the age of 17.,also there is an improvement rate between the pre- and post measurements in favor of the post measurement in all physiological measurements and skilful tests of research sample.

Key words: *qualitative training program- physiological responses-skilsul variables- football.*

Introduction:

The defensive and attacking compound movements in football and physical elements related with them which are performed in the light of lactic aerobic energy system require from the player to repeat exerting explosive bursts of energy in successive periods and during the match. This depends on anaerobic reconstructing of (ATP) as the source of energy is a nutritional source that comes from the metabolism of carbohydrates converted to a plain form of glucose which can be used in producing energy as well as stored in the form of glycogen in liver and muscles to be used later. When using glycogen to produce energy in the absence of oxygen, it results in accumulating lactic acid in muscles which causes tiredness.(1),(2),(16).

To achieve the required success, the effect of any training program should depend on two factors; the first concerns with available information about physiological operations related with performance development. The second is the ability to use this information in the physiology of muscular work and operations of metabolism to produce the required energy of Muscle contraction. (17).

Various studies asserted on the positive effect of athletic training of different body systems through developing physical, skilful and functional aspects in a distinguished and precise way to achieve the high levels of athletic fitness for players.

Amr Allah Al-basty argued that the research in the fatigue phenomenon is one of the most important scientific fields depending on it to enhance achievement levels. The explanation of this phenomenon aims to confine training programs that help develop player's skills in order to endure intensive training.(5)

Due to the importance of studying physiological responses of players and their relation with skilful performance of football juniors, and the experience of the researcher in teaching and training football, the researcher noticed fatigue marks on the juniors after a period of time of the beginning of training that differ from one junior to another one. It is clear from wrong passes and kicks during attacking and many individual and group mistakes during defense that lead to not committing with the plan whether individually or in group of the team. That triggered the researcher to study the reasons of this phenomenon through examining the effectiveness of a suggested qualitative training program on some physiological responses and skillful variables for 17 years- old football juniors.

The objective of the Research : This research aims to effectiveness of a suggested qualitative training program on some physiological responses and skillful variables for 17 years- old junior footballers through:

- Identifying the effectiveness of s suggested qualitative training program on some physiological responses of 17 years- old football juniors.
- Identifying the effectiveness of s suggested qualitative training program on some skillful variables of 17 years- old football juniors.
- Identifying the improvement rate in some physiological responses and skillful variables for 17 years- old football juniors.

Research Hypotheses:

- There are statistical significant differences between the pre and post measurement in the physiological measurements for research sample of 17 years- old football juniors in favor of the post measurement.
- There are statistical significant differences between the pre and post measurement in the skillful variable tests for research sample of 17 years- old football juniors in favor of the post measurement.
- There are statistical significant differences between the pre and post measurement in the improvement rate in favor of the post measurement in physiological measurements and skillful variable tests for research sample of 17 years- old football juniors.

Research procedures:

Research Methodology:

The researcher used the experimental method due to its appropriateness to the nature and procedures of the research, through using the experimental design for one experimental group and pre and post measurements.

Research sample:

The population study consisted of (87) football juniors that were selected from four clubs under the age of (17) at El-baha district in kingdom of Saudi Arabia. These clubs are El-baha, El-ameed, al sorah and Al-tasamouh which are registered at the football Saudi federation for the sports season 1433/ 1434 H. . The researcher selected research sample using deliberate method from junior football players under the age of 17 at El-tasamouh club in Al-Qunfudah governorate, the total main sample (18 junior players) as well as the survey study sample (8 junior players) ,the total number of the sample becomes (26) junior players. The researcher conducted homogeneity on the in question variables of research sample to ensure that research sample was under the normal curve.

Data Collection Tools:

1- Physiological variables:

Table (1)
physiological variables and measurement unit

N	variable	measurement unit	Measurement tool
1	Heart rate	Pulse/ minute	oxygen/ 5 device
2	maximal oxygen consumption	Liter / minute	
3	Aero-ventilation volume	Liter / minute	
4	Respiratory fitness variable (Mets)	Milliliter /kilogram/minute	

2- Skilful variables:

N	skilful variables	Tests	Unit of measurement	Measurement tool
1	Wind run with a ball	Wind run with a ball between posts	second	Stop watch
2	Kicking the ball with internal facet of foot	Kicking the ball with internal facet of foot to the furthest distance	meter	Measurement tape
3	Kicking the ball with external facet of foot	Passing the ball into a painted goal on the ground	meter	Measurement tape
4	fixing the ball under foot	fix the ball under foot to the furthest distance	score	Measurement tape
5	Trapping the ball with foot front	Controlling the ball by trapping it with front side	score	Measurement tape
6	Chest trap	Controlling the ball with chest trap	score	Measurement tape
7	Kicking the ball with head from a fixed position	Kicking the ball with head from a fixed position in a distance	meter	Measurement tape

Scientific variable tests:

1- Reliability:

The researcher has identified Reliability coefficient by applying physiological measurements and skills tests and reapplying them after three days on the survey sample.

Table (3)

difference significance and Reliability coefficient between the first and second application of the survey sample in physiological measurements. N= 8

Physiological measurements	1st application		2nd application		T value and its significance	R value and its significance
	mean	standard deviation	mean	standard deviation		
Heart rate	74.94	1.82	75.06	1.21	0.36	*0.94
maximal oxygen consumption	3.55	0.31	3.51	0.24	0.25	*0.97
Aero-ventilation volume	37.58	0.71	37.46	0.72	0.98	*0.96
Respiratory fitness variable (Mets)	13.26	0.38	13.19	0.37	0.57	*0.94

(T) tabulated value at a level of 0.05 =1.895

(R) tabulated value at a level of 0.05 =0.622

Table (4)

difference significance and reliability coefficient between the 1st and 2nd applications for survey sample at skilful tests. N= 8

Skilful tests	1st application		2nd application		T value and its significance	R value and its significance
	mean	standard deviation	mean	standard deviation		
Wind run with a ball between posts	13.05	.69	12.83	0.62	0.93	*0.96
Kicking the ball with internal facet of foot	18.29	0.45	18.14	0.77	0.79	*0.99
Kicking the ball with external facet of foot	18.87	0.77	18.79	0.85	0.41	*0.93
Trapping dribbling ball inside a circle	17.55	0.71	17.68	0.72	0.86	*0.93
Controlling the ball by front foot trap inside a circle	15.92	0.57	16.03	0.69	0.85	*0.95
Controlling the ball by chest trap inside a circle	17.10	0.65	16.99	0.54	0.96	*0.97
Kicking the ball with head from a fixed position in a distance	4.40	0.48	4.44	0.44	0.91	*0.96

(T) tabulated value at a level of 0.05 =1.895

(R) tabulated value at a level of 0.05 =0.622

It is clear from tables (3), (4) that there are no significant statistical differences between scores of the 1st and 2nd applications of the survey sample at the physiological measurements and skill tests, whereas the T value of the calculated reliability coefficient exceeded its tabulated value at abstract value 0.05.Also, it is clear from these tables that there is a significant relation between scores of survey sample in 1st and 2nd application whereas correlation coefficient of calculated (R) exceeds its tabulated value at abstract level 0.05. This means the reliability of test scores when reapplying when reapplying it in the same conditions at a second time.

2- Validity:

To identify reliability coefficient, the researcher has applied discrimination validity by using the same results of survey sample tests of reliability then comparing with another group of (8) players from 1st team at El-tasamouh sport club, Al-Qunfudah Governerate.

Table (5)

difference significance between two discriminated groups of survey sample physiological measurements. N1=N2=8

physiological measurements	Discriminated group		Survey sample group		(T)value and its significance
	mean	standard deviation	mean	standard deviation	
Heart rate (FH)	68.50	2.56	74.94	1.82	*6.64
maximal oxygen consumption(vo2)	4.47	0.51	3.55	0.31	*4.58
Aero-ventilation volume(VE-ED)	33.74	1.02	37.58	0.71	*10.57
Respiratory fitness variable (Mets)	15.67	1.13	13.26	0.38	*6.17

(T) tabulated value at a level of 0.05 =1.753

Table (6)

difference significance between the discriminated and survey sample groups in physiological measurements.

Skilful tests	Discriminated group		Survey sample group		(T)value and its significance
	mean	standard deviation	mean	standard deviation	
Wind run with a ball between posts	10.48	0.77	13.5	0.69	*6.56
Kicking the ball with internal facet of foot to the furthest distance	21.25	1.28	18.29	0.45	*6.80
Kicking the ball with external facet of foot to the furthest distance	22.13	1.25	18.87	0.77	*7.73
Trapping dribbling ball inside a circle	20.25	1.58	17.55	0.71	*5.11
Controlling the ball by front foot trap inside a circle	18.40	0.78	15.92	0.57	*7.82
Controlling the ball by chest trap inside a circle	21.10	1.34	17.10	0.65	*7.49
Kicking the ball with head from a fixed position in a distance	5.63	1.06	4.40	0.48	*2.94

(T) tabulated value at a level of 0.05 =1.753

It's clear from the tables (5) and (6) that there are statistical significant differences between scores of Survey sample and Discriminated groups in favor of the Discriminated group in physiological measurements and skills tests whereas the (T) value exceeded (T) tabulated value at a rate of 0.05 and, this indicates the ability of these measurements and tests to discriminate between different levels that means its credibility to measure for which it was made .this indicates the reliability of measurements and tests.

Pre- measurements:

The researcher conducted and applied pre-measurement on the research sample; (18) juniors during the period from Wednesday 13-9-1433 H. until Thursday 14-9-1433H. in all in -questioned skilful and physiological variables.

Program application:

The researcher applied the suggested training program on research sample during preparation period from Saturday 7-10-1433 H. until Friday 3-12- 1433H. for (8) weeks ,(4) training units per week and the allotted time for one unit is nearly (120) minutes

Post- measurements:

Post measurements have been conducted on the research sample and under the same conditions and specifications of the pre-measurements on the same in -questioned variables and after the end of applying the program from Sunday 5-12-1433H. until Monday 6-12-1433H.

Statistical analyses

The researcher conducted the research using proper statistical analyses and Statistical Package for the Social Sciences (SPSS). The researcher calculated the following:

-Mean - Median - Standard deviation - Coefficient of Skewness Differences significance test - simple correlation coefficient (Pearson) - improvement rate

Results and Discussion:

Table (7)

mean and standard deviation and (T) value between the pre and post measurements in under- questioned physiological variables. N=18

Physiological variables	Pre-measurement		Post measurement		(T)value and its significance
	mean	standard deviation	mean	standard deviation	
Heart rate (FH)	75.25	1.96	71.83	3.73	*3.50
maximal oxygen consumption(vo2)	3.75	0.94	4.89	1.18	*3.59
Aero-ventilation volume(VE-ED)	36.12	2.06	33.28	1.56	*5.54
Respiratory fitness variable (Mets)	13.08	1.30	14.44	1.20	*3.36

(T) tabulated value at a level of 0.05 and degrees of freedom (17) =1.740.

It is clear from table(7) that there are statistical significant between pre and post measurements in favor of the post measurement in Physiological variables "Heart rate (FH)- maximal oxygen consumption(vo2) - Aero-ventilation volume(VE-ED)- Respiratory fitness variable (Mets) " in favor of the post application.

Results indicated that the suggested training program using qualitative trainings is characterized by integration, balance, inclusiveness and rationalizing training intensity that leads to lowing impulse rate of research sample. The researcher also attributed these results to the effect of the suggested training program in increasing blood speed returning from heart thus increasing the volume and amount of blood in one time that leads to lower heart beat rate as there is an inverse relation between heart size and its beats. The pushed blood volume is increased in one time that allows to better nourishment of muscles. The results of that research are consistent with those of Cecan,A.(2004) (19), Abd-elaziz,A.(2007)(13), Omar,A.,(1999)(14), Mahmmoud, I.(2007)(6).

The researcher argues that the training program by using suggested qualitative exercises increases the net area of Capillaries of players consequently supplies muscles with oxygen and increases the volume of maximal oxygen consumption (vo2). This is important for a lot of physiological functions as the efficiency of respiratory and Circulatory systems to conduct inspiration air to blood, efficiency of metabolism operations and produce energy. So the first hypothesis is achieved.

Table(8)

the mean , standard deviation and (T) value between pre and post measurements of skilful tests. N= 18

Skilful tests	Pre-measurement		Post measurement		(T)value and its significance
	Mean	Standard deviation	Mean	standard deviation	
Wind run with a ball between posts	12.27	0.75	11.39	1.37	*4.77
Kicking the ball with internal facet of foot to the furthest distance	18.22	0.99	20.61	1.82	*4.82
Kicking the ball with external facet of foot to the furthest distance	19.07	1.35	20.82	1.49	*4.05
Trapping dribbling ball inside a circle	17.83	0.71	19.22	0.94	*5.16
Controlling the ball by front foot trap inside a circle	15.88	1.08	17.33	1.50	*3.51
Controlling the ball by chest trap inside a circle	17.15	1.47	19.33	1.50	*4.09
Kicking the ball with head from a fixed position in a distance	4.52	1.04	5.40	1.15	*3.22

(T) tabulated value at a level of 0.05 and degrees of freedom (17) =1.740.

The results of the table(8) showed that there are statistical significant differences in skilful variables: Wind run with a ball between posts, Kicking the ball with internal facet of foot to the furthest distance, Kicking the ball with external facet of foot to the furthest distance, Trapping dribbling ball inside a circle, Controlling the ball by front foot trap inside a circle, Controlling the ball by chest trap inside a circle, Kicking the ball with head from a fixed position in a distance) between the pre and post measurements in favor of the post measurement.

The results indicated that the suggested training program using qualitative exercises develop these skilful variables and this consistent with the results of Forsght j., and et al(2000)(20), Tony C. (2012)(27) Hassan Ibrahim Ali.,(2003)(9) , Valdimir Liakh, Zumuda Wladyslaw, Zbigniew Witkowski(2001)(23) , Talha Hossam El-din(7) , Mohammed Hassan Alawy(12). Gerhard Z. (2012)(23)

Also, these results are consistent with Talha Hossam El-din(1997)(11) , Frank T. (2011)(21) Mohammed Hassan Alawy (1990)(17), Gerhard B. (2012)(22) Mohammed Abdel-reheem Ismaeil(1995)(18), Hanafi Mokhtar (1990)(10). These studies indicated that training using exercises with severe specialty by scientifically- confined and organized training is important to help football players gain abilities needed to perform main skills efficiently and effectively in order to endure match loads and avoid match injuries as possible.

The researcher referred these differences to the effect of the training program using qualitative trainings with weights and different devices, also with or without using tools. The researcher argues that the improvement in special physical abilities related with skilful performances led to performance improvement level of in-questioned basic skills. This is due to the designed and selected qualitative exercises worked in two different directions to develop special physical abilities of football players and at the same time would develop and improve skilful performance level as it was performed in a very special way which was similar to performing the skills in kinetic time and motor track to perform these skills and the required strength, also the work of muscles, which perform the skills during matches and training.

Table (9)

improvement rate between the pre and post measurements of the research sample in physiological variables.

physiological variables	Pre-measurement	Post measurement	Improvement rate	rank
Heart rate (FH)	75.25	71.83	4.54%	fourth
maximal oxygen consumption(vo2)	3.75	4.89	23.31%	first
Aero-ventilation volume(VE-ED)	36.12	33.28	7.86%	third
Respiratory fitness variable (Mets)	13.08	14.44	9.42%	second

Table (10)

improvement rate between the pre- and post-measurements for the research sample in skillful variables.

Skilful variables	Pre-measurement	Post measurement	Improvement rate	Rank
Wind run with a ball between posts	13.27	11.39	14.17%	Second
Kicking the ball with internal facet of foot to the furthest distance	18.22	20.61	11.60%	Third
Kicking the ball with external facet of foot to the furthest distance	19.07	20.82	8.41%	Fifth
Trapping dribbling ball inside a circle	17.83	19.22	7.23%	Seventh
Controlling the ball by front foot trap inside a circle	15.88	17.33	8.37%	Sixth
Controlling the ball by chest trap inside a circle	17.15	19.33	11.28	Fourth
Kicking the ball with head from a fixed position in a distance	4.52	5.40	16.30%	First

The tables (9) and (10) indicate the improvement rate between pre and post measurements in skilful and physiological measurements and tests.

Table (12) showed that there are differences in favor of post-measurement in all in-questioned physiological measurements and the highest rate of change in physiological measurements was in maximal oxygen consumption(vo2) with 23.31% whereas the lowest rate of change was in Heart rate (FH) with 4.54%.

Table (13) showed that there are differences in favor of post-measurement in all in-questioned skilful tests and the highest rate of change in skilful tests was in kicking the

ball with head in a distance test with 16.30% whereas the lowest rate of change was in Trapping dribbling ball inside a circle with 7.23%.

Conclusions:

On the basis of research results, the researcher has considered the following recommendations:

1- 1-The suggested qualitative training program has a positive effect with a statistical significance in the improvement of physiological responses (Heart rate (FH)- maximal oxygen consumption(vo2)- Aero-ventilation volume- Respiratory fitness variable (Mets)) for research sample of junior football players under the age of 17.

2- 2-The suggested qualitative training program has a positive effect with a statistical significance in developing skilful performance level for tests of (Wind run with a ball between posts- Kicking the ball with internal facet of foot to the furthest distance- Kicking the ball with external facet of foot to the furthest distance - Trapping dribbling ball inside a circle- Controlling the ball by front foot trap inside a circle- Controlling the ball by chest trap inside a circle- Kicking the ball with head from a fixed position in a distance) for research sample of junior football players under the age of 17.

3- 3-The results indicated an improvement rate between the pre and post measurements in favor of the post measurement in all physiological measurements of the research sample.

4- 4-The results indicated an improvement rate between the pre and post measurements in favor of the post measurement in all skilful variables of the research sample.

Recommendations:

In the light of the research results and their explanations, the researcher recommends the following:

1- The importance of benefitting from the suggested qualitative exercises to develop skilful performance level and physiological responses of football juniors and using these exercises in training programs

2- The importance of trainers to make interest with analyzing skilful performance before selecting specific exercises to guarantee the best choice for suitable exercises.

3- Concerning with skilful and physiological assessment of football juniors through conducting measurements and periodical tests to determine their actual level to guarantee making suitable exercise programs.

4- Conducting similar studies on samples of different ages in football and other sports.

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