

# “The Effect of using Two Recovery Methods on some Physiological Variables of Tennis Players”

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## ABSTRACT

The world is currently witnessing a noticeable development in various aspects of life as phenomena were subject to scientific research in various fields as the optimal way to solve a lot of problems. This study aims to define some physiological variables under the effect of using two methods to restore recovery for tennis players. The researcher used the semi-empirical method to be consistent with type and nature of the study. The sample of the study was selected among tennis players from Dhuk governorate's championship among ten applicants. They were divided into two groups. Each group consists of five players. Group equivalence was performed and the most significant conclusions were: using massage during breaks between matches has a positive effect on some physiological variables for the group which uses massage. The most significant recommendations were: utilizing recovery restoration methods, especially massage, during breaks between matches in various championships and helping all tennis trainers and players to make use of them in accelerating recovery restoration for players during championships and intensive training.

**Keywords:** Effect, recovery, physiological, tennis, players

## INTRODUCTION

The world is currently witnessing a noticeable development in various aspects of life as phenomena were subject to scientific research in various fields as the optimal way to solve a lot of problems. Rest is one of the main pillars of sport training. However, there are multiple interpretations concerning the methods by which they are implemented in order for the athlete to return to the normal condition and accelerating recovery process. Exchange between effort and rest is evident during training as training work imposed before and the role of breaks in removing fatigue. (Zainab Abdulhamid & Yasser Ali, 2005: 69).

Massage is one of the physical, physiological and psychological means that help enhance performance and restore recovery through strengthening and activating physical, physiological and psychological aspects (functions of body organs) and not having injury. In addition, tennis is one of the games that need long time in order to reach good athletic level through this period. It is also necessary to stress on fitness training that should coincide with planning performance training (Ellen Wadea Farag, 2009: 11).

Performing playing strikes such as backhand, forehand and serve all require quick strength, response and acceleration in addition to the required flexibility and agility. A lot of sport literature proved that there is a positive relation between special fitness and performance accuracy due to the type of practiced athletic activity (Kamal Abdulhamid Ismail, 2010: 18). The movement of arms and feet is one of the most important factors that contribute to success of players in performing various hits (Harry, 1995: 76).

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Sport activity is generally followed by a temporary drop in the ability to perform and during breaks (the period of recovery) to return gradually to normal (Arnbein, 1987: 2). High sport results cannot be reached without recovery to get rid of fatigue resulting from loads (Abu Al Alaa Abdulfattah, 1999: 54). Significance of the study is evident in the attempt of defining the best and correct use by trainers of recovery restoration means such as massage, positive rest, icepacks, sauna and shower.

### Problem of the Study

Through the researcher's experience in his continuous follow-up of tennis championships of Dhuk governorate, he noticed that most players do not benefit from time durations between matches during championships properly which may have a negative effect on continuing players' performance efficiently under match loads, especially during final rounds of championships and this is the problem of the study.

The researcher will use two methods for recovery restoration allowed for use during time periods between matches including massage, positive rest training for major working muscles, assisting, opposite and equivalent muscles.

### Objective of the Study

The study aims to define some physiological variables under the effect of using two methods to restore recovery for tennis players.

### Hypotheses of the Study

1. There are statistically significant differences between pre- and post-tests for some physiological

variables of tennis players in the group using massage in favor of post-test.

2. There are statistically significant differences between pre- and post-tests for some physiological variables of tennis players in the group using positive rest in favor of post-test.
3. There are statistically significant differences between the group using massage and the group using positive rest in post-test for players in some physiological variables in favor of the group using massage.

## METHODOLOGY

The researcher used the semi-empirical method to be consistent with type and nature of the problem.

### Population & Sample of the Study

The sample of the study was selected among tennis players from Dhuk governorate's championship among ten applicants during the period from 11/06/2016 to 15/06/2016. They were 14 players among them there are 4 players eliminated for their participation in exploratory trial to make total number of sample of (10 persons) divided into two groups and each group consists of five players.

In order to determine equivalency of research sample members in terms of weight, length and age, skewness coefficient was used as all its values were less than (+3) which shows good distribution and homogeneity of the sample.

Table 3 shows that the value of the Mann-Whitney test consecutively for physiological variables (heart

**Table 1:** Properties of the study sample

Total sample no.		Exploratory sample		Main trial sample		Both groups of the study			
						Massage group		Positive rest group	
Number	%	Number	%	Number	%	Number	%	Number	%
14	100	4	28.6	10	71.4	5	35.7	5	35.7

**Table 2:** Equivalence of groups of the study in growth (anthropometric) variables, arithmetic means, standard deviations S.D and skewness for both groups of the study

S. No.	Variables	Measure units	Massage group		Positive rest group		Skewness
			Mean	S.D	Mean	S.D	
1	Length	Centimeter	171.6000	2.07364	173.2000	1.48324	0.552
2	Weight	Kilogram	69.4000	1.14018	69.4400	1.11937	0.373
3	Age	Year/month	19.4500	0.36056	19.4600	0.37316	1.785

**Table 3:** Significance of statistical differences for first & second measurements after effort for both groups of the study with Mann-Whitney test significance to show equivalence in some physiological variables after effort

S. No.	Variables	Measure unit	Groups	Number of group members	Mann-Whitney test value	Possibility
1	Beats after effort	bpm	Massage group Positive rest group	5 5	0.000	2.619
2	Flexor blood pressure after effort	mmol/z	Massage group Positive rest group	5 5	0.000	2.627
3	Diastolic blood pressure after effort	mmol/z	Massage group Positive rest group	5 5	7.000	1.170
4	Lactic concentration in blood after effort	mmol/l	Massage group Positive rest group	5 5	2.500	2.095
5	Glucose concentration in blood after effort	Mlg/mml	Massage Group Positive rest group	5 5	2.000	2.227

rate, flexor and diastolic blood pressure after effort, lactic and glucose concentration after effort) were: (2.22, 2.10, 1.17, 2.62 and 2.62) with possibility value of all physiological variables was bigger than error level (0.05) which shows equivalency between both groups of the study.

### Exploratory Trial

Exploratory trial was conducted with the aim of determining the time lasted for making measurements, ensure healthy and safety of the used devices as well as explaining the way of using recovery restoration method based on total other than own groups on a sample from population of the study and outside the main sample of the study.

### The Main Trial

The main trial was conducted on the sample of the study (10 tennis players) divide into two groups. First groups uses recovery restoration, the second group uses positive rest restoration method in Dhuk governorate's championship in the period between 11/06/2016 and 15/06/2016. Physiological measurements were taken from each player of group members after completing performance of the first match directly. Next, the researcher applied massage and positive rest for recovery restoration on each player and according to total score under specialists' supervision right after ending the first match. After that, he measured the same physiological variables for members of the study sample based on each one's group right after the end o second match.

Table 4 shows that the calculated (z) values at Wilcoxon test significance were (2.06, 2.03, 2.3, 2.03, 2.02 and

2.02 consecutively), while possibility levels were (0.039, 0.042, 0.042, 0.043 and 0.043 consecutively) and they are all less than (0.05), which means that there are statistically significant differences in favor of measurements after using massage for post-test and there is a notable improvement in members of this group who use massage. The researcher attributes this improvement in the heart rate, flexor and diastolic blood pressure to the use of massage as a means for recovery restoration, as it helps the body return to its normal state, aims to relax muscles and get rid of muscle tension resulting from training and competition (Abdulalaa Abdulfattah, Ahmed Nasr El Din, 1993, 38).

In addition, there is an improvement in lactic acid concentration in blood for the massage group, as massage leads to quick recovery of inner body systems and quick restoration of energy stored in muscles (Abdulalaa Abdulfattah, 1998, 264). The researcher also attributes enhancement in glucose percentage in blood, or its reduction after massage in the group as a means for recovery, to the increase in Insulin's concentration in blood leading to a reduction in glucose during negative rest periods as a result of increasing insulin concentration, and then glucose turns into glycogen to be stored once again in the lever (Artham, 1997, 14).

Table 5 shows that the calculated (z) values at Wilcoxon test significance were (-2.02, -1.46, -1.46, 2.02 and 2.02 consecutively), while possibility levels were (0.043, 0.144, 0.144, 0.042 and 0.041 consecutively) as physiological variables such as heart rate, lactic and glucose concentration after effort were less than (0.05), which means that there are statistically significant differences, while physiological variables for

**Table 4:** Significance between first and second measurement after effort in some physiological variables in the massage group

S. No.	Variables	Measure units	Pre-test		Post-test		Z Value (Wilcoxon)	Possibility
			Mean	S.D	Mean	S.D		
1	Beats after effort	bpm	166.80	1.48	163.40	1.14	2.06	0.039
2	Flexor blood pressure after effort	mmol/z	134.00	1.58	130.40	2.07	2.03	0.042
3	Diastolic blood pressure after effort	mmol/z	68.80	1.30	64.60	1.14	2.03	0.042
4	Lactic concentration in blood after effort	mmol/l	7.37	0.21	5.19	0.02	2.02	0.043
5	Glucose concentration in blood after effort	Mlg/mml	107.40	0.44	101.72	0.42	2.02	0.043

**Table 5:** Significance between first and second measurement after effort in some physiological variables in the positive rest group

S. no	Variables	Measure units	Pre-test		Post-test		Z value (Wilcoxon)	Possibility
			Mean	S.D	Mean	S.D		
1	Beats after effort	bpm	172.88	0.98	168.66	0.67	-2.02	0.043
2	Flexor blood pressure after effort	mmol/z	138.80	0.84	138.08	0.13	-1.46	0.144
3	Diastolic blood pressure after effort	mmol/z	70.00	1.58	68.78	0.41	-1.46	0.144
4	Lactic concentration in blood after effort	mmol/l	7.01	0.23	6.14	0.03	2.02	0.042
5	Glucose concentration in blood after effort	Mlg/mml	108.60	0.55	106.90	0.35	2.02	0.041

flexor and diastolic blood pressure were bigger than the error percentage (0.05) and this means that there are no statistically significant differences between measurements before and after effort. The researcher attributes this significance in post-test for the positive rest group to physiological variables such as heart rate, lactic and glucose concentration in positive rest help shorten recovery period, quick restoration of heart rate and getting ready for the next match (Abdulalaa Abdulfattah, 1982, 19). In addition, there is an improvement in lactic acid's concentration in blood for the positive rest group in post-test as intensity of exercises for recovery and dispose lactic acid was 30% to 45% of  $VO_2$  Max (Abdulalaa Abdulfattah, 1999, 76).

Concerning improvement of glucose in blood and its reduction after using positive rest, it led to increase insulin's concentration in blood and reduction after using positive rest exercises leading to increase insulin's concentration in blood and reduction in glucose during breaks between matches as a result of insulin's concentration and then turns into glucose and glycogen is stored in liver (Arthiem, 1997, 14). In addition, non-

enhancement in blood flexor and diastolic pressure after blood is because exercises used by positive rest group for recovery lead to another type of activity, which is low intensity activity or may be more than 45% not leading to recovery as blood flexor and diastolic pressure does not return to normal condition (Abulela Abdulfattah, 1998, 199).

Table 6 shows that the Mann-Whitney test values for physiological variables were (2.62, 2.66, 2.63, 2.61, and 2.61 consecutively), while possibility levels were (0.009, 0.008, 0.009, 0.009 and 0.009 consecutively) and they are all less than error percentage (0.05), which means that there are statistically significant differences in post-tests in favor of the massage group as arithmetic means showed better enhancement. The researcher attributes this to the use massage methods that help quick body building and increase muscle work ability (Abulela Abdulfattah, 1998, 13). In addition, the enhancement for the massage group members as a means for recovery in heart rate, flexor and diastolic blood pressure is due to great resistance by unwanted mechanical and thermal effects and the massage effect can be seen in increasing

**Table 6:** Significance of statistical differences between post-measurements between massage and positive rest groups in Mann-Whitney test

S. No	Variables	Measure units	Post-test for massage group		Post-test for positive rest group		Mann-Whitney test value	Possibility
			Mean	S.D	Mean	S.D		
1	Beats after effort	bpm	163.40	1.14	168.66	0.67	2.62	0.009
2	Flexor blood pressure after effort	mmol/z	130.40	2.07	138.08	0.13	2.66	0.008
3	Diastolic blood pressure after effort	mmol/z	64.60	1.14	68.78	0.41	2.63	0.009
4	Lactic concentration in blood after effort	mmol/l	5.19	0.02	6.14	0.03	2.61	0.009
5	Glucose concentration in blood after effort	Mlg/mml	101.72	0.42	106.90	0.35	2.61	0.009

blood vessel movement to resistance, pressure reduction in massage vessels and general renewal in body cells (Zainab Abdulhamid & Yasser Ali, 2005: 32).

The researcher attributes the enhancement in concentrations of lactic acid and glucose in blood by members of massage group to recover as massage affects blood circle in massage areas, removes accumulated fluids, lactic acid, increases blood flow in the heart and moves fluids inside cellular fibers causing pain (Cecit, M., 1192, 128). Finally, the researcher found that the total used in massage is better than the total for positive rest in some physiological variables for recovery.

## CONCLUSIONS & RECOMMENDATIONS

### Conclusions

The researcher concluded the following:

1. Using massage during breaks between matches for tennis players has a positive effect on some physiological variables for the group which uses massage.
2. Using positive rest training during breaks between matches for tennis players has a positive effect on some physiological variables except for glucose concentration in blood for positive rest group.
3. Using massage as one of the means of recovery restoration during breaks between matches is better than positive rest in some physiological variables for tennis players.

### Recommendations

1. Considering the use of recovery restoration means during tennis players' training.
2. Utilizing recovery restoration methods, especially massage, during breaks between matches due to their positive effect on enhancing some physiological variables for tennis players.
3. Helping all tennis trainers and players to make use of them in accelerating recovery restoration for players during championships and intensive training.

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