

The Swedish Journal

ISSN:2001-9211

Of Scientific Research

Volume 2 Issue 5, May 2015



No.	Title	Page
1	BUILDING NEUROLOGICAL LINGUISTIC PROGRAMMING NLP SCALE FOR APPLYING FOOTBALL PLAYERS	1-14
2	DISORDERED EATING- PREVALENCE IN SPORTS AND ORAL MANIFESTATIONS- A REVIEW	15-28
3	EFFECTS OF A 9 MONTHS EXERCISE TRAINING ON INFLAMMATORY AND LIPID MARKERS IN TYPE 2 DIABETIC PATIENTS	29-38
4	TEMPORAL PERCEPTION OF THE PERFORMANCE OF VOLLEYBALL PLAYERS IN THE COMPETITION	39-52
5	THE EFFECT OF NUTRITION USING SATURATED AND UNSATURATED FATS ON ENDURANCE FOR ATHLETES APPLYING FOR CLUBS	53-56
6	THE EFFECT OF PLYOMETRIC STRENGTH TRAINING ON DEVELOPING THE MOST IMPORTANT PHYSICAL ABILITIES, SPIKES PERFORMANCE AND BLOCKS FOR VOLLEYBALL JUNIOR PLAYERS	57-63
7	THE EFFECT OF THE DISABLING FORCE USING PARACHUTE IN DEVELOPING THE FAST AND EXPLOSIVE FORCE IN TERMS OF THE INSTANT PUSH TOWARDS THE TWO STAGES OF THE APPROACH AND THE UPGRADE TO THE LON	64-69
8	THE EFFECT OF USING A PROPOSED TOOL IN ENHANCING PERFORMANCE & ACHIEVEMENT LEVELS DUE TO SOME BIO-KINEMATIC VARIABLES OF THE JAVELIN THROW	70-76
9	THE EFFECT OF USING RUBBER ROPES TO IMPROVE SPEED-STRENGTH FOR UPPER LIMBS AND THE ACHIEVEMENT OF JAVELIN THROW	77-82
10	THE EFFECTIVENESS OF USING THE SOCIAL NETWORK SITES BY PHYSICAL EDUCATION DEPARTMENT IN PTUK – KADOORIE	83-90
11	THE REGULATION OF SPORTS DISPUTES (CAS: INTERNATIONAL LEVEL / TCNSA: TUNISIAN NATIONAL LEVEL)	91-97
12	THE RELATION BETWEEN FOOT'S LENGTH & WIDTH WITH SOME PHYSICAL ABILITIES AND PERFORMANCE ACCURACY OF SOME BASIC SKILLS OF FEMALE VOLLEYBALL PLAYERS	98-101

BUILDING NEUROLOGICAL LINGUISTIC PROGRAMMING NLP SCALE FOR APPLYING FOOTBALL PLAYERS

Alaa Zohear Moustafa

Dialy University, Faculty of Physical Education

Abstract

Neurological Linguistic Programming (NLP) plays an important role in raising sporting and human activity. It helps man reform his thinking enhance his behavior, purify his habits, motivating and improving his intellectual abilities. Neurological Linguistic Programming (NLP) considers the issue of success and failure as a process that can be made and is not coincidental. Measurement is the only scientific Mean that should be used by sporting clubs to identify players' brain programming in order to enhance individual levels and solve problems facing him. We can say that this study is the first in the field according to the researcher as there was not any previous study tackled building a scale for Neurological Linguistic Programming (NLP) in sports in Iraq and the Arab World, so the current study is s scientific and knowledge addition in this field that may serve researchers and sporting club officials in our country.

Problem of the study: Is there a Neurological Linguistic Programming (NLP) scale for applying football players?

Objective of the study: Building a Neurological Linguistic Programming (NLP) scale for applying football players.

Keywords: Neurological , Football mellitus , immune markers , risk factors , physical endurance

1. INTRODUCTION

Sport achievements by athletes in various games in general and team games in particular were not coincidental. These achievements emerged through the development of various sport sciences as well as following correct scientific approaches in an attempt to invest human energy in its best forms. The researcher found that many modern psychological researches and studies refer that a lot of sport failures and not achieving the hoped results are due to multiple factors including weak personal experience, weakness of self-confidence, negative thinking and behavior, unclear goals of players, weakness success achievement and not changing negative beliefs into positive ones. Neurological Linguistic Programming (NLP) plays an important role in raising this type of human activity and helps man reform his thought, enhance his behavior, purifies his habits and motivates his mental abilities and skills. Neurological Linguistic Programming (NLP) considers success and excellence as a process that can be made and not a coincidental one as there is one of hypotheses of Neurological Linguistic Programming (NLP) that says: "There is no luck, there is a result. There is no coincidence, but there are reasons and causes". Neurological Linguistic Programming (NLP) links mind with body. Your way of thinking affects the way you run, breathe and feel. Your feelings affect your commitment, energy and motivation as mind and body are separate words of the same experience. Whenever we learn the effect of each on one another, we will be able to achieve the best results.

In addition, the importance of the study lies in that Neurological Linguistic Programming (NLP) plays this important role in sport performance, so it was important to measure Neurological Linguistic Programming (NLP) of football layers in Iraq. If we realize that there is no Arab and Iraqi sporting measurement tool for this concept, this will increase the importance of the study. Therefore, it is better to design a scale for Neurological Linguistic Programming (NLP) for football players in order to be used by trainers in measuring this concept in their players. As a result, this will contribute to sporting success in order to serve and develop the game in Iraq.

The problem of the study is represented in the absence of an Iraqi, Arab or foreign sporting measurement tool of Neurological Linguistic Programming (NLP), so the researcher decided to build a scale for Neurological Linguistic Programming (NLP) for applying football players as it was not present before and it is the one of its kind in this field. Neurological Linguistic Programming (NLP) is a helping method towards changing man. It is concerned with changing oneself and affecting others through thought reform, behavior enhancement, encouragement and modifying habits and supporting decisions. The science of Neurological Linguistic Programming (NLP) tackles a set of abilities of using language of the mind in a positive manner that enables us to achieve our goals.

- Programming: our thoughts, feelings and behaviors as it is possible to exchange familiar programs with other new and positive ones.
- Linguistic: it is the way by which we use the language of senses and words and how this affects our conceptions and the relation to the Inner world as language is a means of dealing with others.

- Neurological: it represents what happened in the brain and the neurological system and how it encodes and stores information inside memory and, in return, recall this information and experience once again. The neurological system is the system that controls body functions, performance and actions such as feeling, behavior and thinking.

2. METHODOLOGY:

The researcher chose the descriptive surveying method as it is the most proper approach to the nature of the problem.

Community & Sample of the Study:

The community of the study is represented in applying football players in the Iraqi premier league (381 players). The sample of the study was chosen purposively for a number of football club players participating in the league except northern Iraq governorates. Table (1) shows the distribution of these players. The exploratory sample if the study included 24 players (6.29%) of community of the study building a scale on 300 players representing 78.74% of community of the study as shown in table (1).

Table (1): Distribution of Study community members and sample:

Serial	Club	Total players	Exploratory questionnaire sample members	Exploratory trial sample members	Main trial sample members	Percentage
1	Baghdad	31	-	-	-	87%
2	Algawya	25	24	-	-	96%
3	Alzawraa	28	-	-	26	92%
4	Police Club	27	-	-	-	88%
5	Altalaba	29	-	-	25	%86
6	Karbalaa	35	-	-	32	%91
7	Alkarakh	33	-	-	30	%91
8	Alminaa	28	-	-	25	%89
9	Almasafi	23	-	-	20	%87
10	Naft Elganob	32	-	-	31	%96
11	Naft Misan	30	-	-	27	%90
12	Al Naft	28	-	-	26	%92
13	Al Nagaf	32	-	-	30	%93
Total		381	24	24	300	78.74%

Scale Designing Procedures:

These procedures include steps followed in building the scale to contain conditions of psychometric characteristics such as validity, reliability, objectivity and ability to distinguish. Allen and Yen refer that the process of building any scale goes through main steps as follows:

Determining the issue that needs to be measured

Determining theoretical principles of building the scale

Determining Fields of the Scale:

The researcher accessed the available literature and scientific sources specialized in Neurological Linguistic Programming (NLP) in addition to literature review. All Arabic and foreign sources that collected by the researcher were presented. Accordingly, in the light of the definition of Neurological Linguistic Programming (NLP), the researcher presented a questionnaire to explore opinions of experts and specialists regarding the validity of the dimensions in the scale that are consistent with the sporting field. The questionnaire was presented to experts to determine the proper dimensions and eliminate improper ones. The experts suggested integration of some dimensions with one another as they measure the same characteristic. Dimensions were integrated according to specialists and experts' opinions and we got the following dimensions in table (2):

Table (2): Experts’ opinions, the counted and table Chi2 value for measurement dimensions:

Serial	dimensions	Experts		Counted chi2 value	Significance level
		Valid	Invalid		
1	Personal experience	5	12	2,88	Random
2	Personal distinction	15	2	9,94	Significant
3	Forming success model	12	5	2,88	Random
4	Determining and achieving goals	17	zero	17	Significant
5	Elements of good preparation of the hoped results	7	10	0,52	Random
6	Environment surrounding the used results and the used values	6	11	1,48	Random
7	Role of your subconscious mind	13	4	14,99	Significant
8	Building communication via consistency	8	9	0,058	Random
9	Building relation and communication	10	7	0,52	Random
10	Consistency & coordination	7	10	0,52	Random
11	Vision by your mind	5	12	2,88	Random
12	Using simplified linguistic structure	7	10	0,52	Random
13	Hierarchical order of ideas	8	9	0,058	Random
14	Using Milton linguistic patterns	6	11	1,48	Random
15	The para-model – deep structure and surface structure	7	10	0,52	Random
16	Warning of using metaphors	7	10	0,52	Random
17	Various feeling situation	6	11	1,48	Random
18	How to determine time line: time encoding	10	7	0,52	Random
19	Relation between behavior and levels of neurological system	6	11	1,48	Random
20	Frames and reframing	11	6	1,48	Random
21	Success strategies	17	zero	17	Significant
22	Determining and using strategies	3	14	2,44	Random
23	The 4 step model of success	9	8	0,058	Random
24	Convention strategy	5	12	2,88	Random
25	Understanding fixings and entering mental state	7	10	0,52	Random

Chi2 value = (3.84), freedom degree (1) and significance level = (0.05)

Dimensions accepted by experts to measure Neurological Linguistic Programming (NLP) in sports are:

(personal distinction, determining and achieving goals, role of subconscious mind and success strategies). In these dimensions, the counted ch2 value (3.84) was more than its table value at freedom degree: (1) and significance level (0.05) for the sake of the answer (valid), as it is the answer that accepts the most frequencies of experts’ opinions, while it can be invalid when the table value is more than the counted value.

Preparing Initial Formula of the Scale’s Items:

In order to prepare initial formula of the scale’s items, the researcher did the following:

Preparing Items of the Scale:

After determining scale dimensions and setting suitable definitions for them, the researcher wrote the items based on Arabic, foreign studies and literature reviews related to build scales to make use of them. The researcher presented an exploratory questionnaire on a sample of the study community (24 players) to help write the biggest number of scale items in a way that eliminates this sample in the main trial.

Determining the Method and Principles of Items Formulation:

The researcher used the Likert model in building Neurological Linguistic Programming (NLP) scale as a way of measuring for the following reasons:

1. Providing more homogeneous scale.
2. Allowing the biggest contrast among individuals.
3. Allowing respondents to indicate the degree of their feelings.
4. Characterized by high reliability and validity.
5. Validity tends to be good because of great field in the allowed responses.

Validity of Items:

After completing initial measurement (including 80 items with positive and negative phrases) and to ensure the correct linguistic formulation of items, the researcher presented them to an Arabic language specialist for linguistic evaluation. After linguistic modifications, items were presented to a group of experts and specialists for the purpose of judgment as in the following table (3):

Table (3): Number of distributed items on dimensions:

Serial	Dimension	Item number
1	Success strategies	20
2	Role of subconscious mind	20
3	Personal distinction	20
4	Determining & achieving goals	20
	Total	80

Experts have suggested a set of observations such as deletion of some items, modifying others and transferring a part of them to other more accepted dimensions than the dimensions in which they are in. In addition, the researcher reformulated some items and transferred others before presenting them once again to experts to show their final situation about these items. After that, specialists and experts in sporting psychology, general psychology, measurement and evaluation in sporting and psychological field expressed their observations and opinions. They suggested removing some items from some fields, whether for their meaning redundancy or for not expressing the related field. To analyze opinions of experts statistically, the researcher used the Chi2 test.

Table (4): results of chi2 of experts’ opinions concerning validity of scale items

Serial	Field	Item number	Experts		Counted chi2 value	Significance level
			Agree	Disagree		
		7,8,2,1,18,16,15,9				
1	Personal distinction	5,3,11,12,13,20 10,14,17,19,	25	5	13,32	Significant
		4,6	30	zero	30	Significant
		3,8,20,19,11,13,2 14,17,	12	18	1,2	Random
2	Role of subconscious mind	1,4,10,17,12,18,15	28	2	22,54	Significant
		5,6,9,7	21	9	4,8	Significant

		2,3,6,8,12,15,17,20	14	16	0,12	Random
3	Success strategies	,1,4,5,16,11,19	23	7	8,52	Significant
		13,14,7,10,18,9	26	4	16,12	Significant
		4,8,6,13,20,9	13	17	0,52	Random
4	Determining & achieving goals	2,3,7,5,11,19	24	6	10,8	Significant
		1,10,12,14,15,16,17,18	27	3	19,2	Significant
		7,8,2,1,18,16,15,9	19	11	2,12	Random

Chi2 table value, freedom degree (1), error (0.05) equals (3.84).

Preparing Scale Instructions:

Scale instructions are the guiding evidence for respondents, so they were considered to be easy, understandable and hiding the real purpose of the scale (not writing the scale's name). In addition, the researcher asserted not mentioning the scale's name as the goal of measurement is only for scientific research. The researcher also asserted the answer of all items of the scale and not ignoring any of them. She also mentioned an example of how to answer the 60 items of the scale that were written without mentioning dimensions to perform the exploratory experiment.

Scale Correction:

After collecting respond documents of the sample, their total degrees were extracted using the related correction key as follows in the table 5:

Serial	Replacement	Negative items marks	Positive items marks
1	Never applies at all	5	1
2	Applies in a small degree	4	2
3	Applies in a fair degree	3	3
4	Applies in a great degree	2	4
5	Applies to a very great degree	1	5

In order to extract full mark, all marks of the player's responses in the 60 items of the scale are collected, so the highest mark is 300 and the least one is 60..

Scientific Principles of Scale Building:

Validity:

Validity is one of the most important psychometric characteristics that should be found in the scale as it refers to the ability of the scale to measure what should be measured. It is a basic and important feature in evaluating any tool and aims to determine how valid the tool is in measuring the measured side showing the test's ability to achieve its task as it should.

The researcher checked the scale validity using two indicators:

First: content validity

Second: structure validity

Content Validity:

This type of validity is checked through reasonable analysis and determining of scale content based on self-judgments. There are two types of validity:

A- Face Validity:

The best way of extracting face validity is represented in showing items of the scale on a group of experts to judge them in measuring any feature in the current scale, so its items were presented to a group of psychology and sport psychology experts.

B- Sampling validity

This type of validity requires accurate indication to subjects or field of the test. The more accurate these subjects are, the higher the sampling validity is. This type of validity focuses on questions and items, while face validity focuses on contents of questions or items regardless of their number. This type of validity is available in the current scale at the beginning of preparing the scale through the definition of Neurological Linguistic Programming (NLP) concept and determining its dimensions with the help of some a group of experts in psychology, sport psychology, measurement and evaluation whose opinions are used in accepting items. After that, the needed modifications were made based on experts’ opinions and observations who agreed on the scale, its 4 dimensions and 60 items.

Second: Construct Validity

It is also called concept validity or proposed content validity because it depends on empirical checking of how applicable the scale degrees to concepts or hypotheses on which the researched depended in his construction. This type of validity is sometimes called “concept validity” and is one of the most appropriate types of validity to build the scale as it depends on empirical checking. The researcher ensured construct validity through three indicators as follows:

1- Discriminatory power of items

It means the ability of items in discriminating higher level individuals from lower level ones relative to the feature measured by the item. This is considered an evidence of construct validity. In order to count discriminatory factors of items, the researcher used the method of the two extreme groups as one of the suitable methods to count items discrimination. It recommends finding discriminatory factor of measurement items using the two extreme groups in the following steps:

- 1- Ordering degrees of players in the scale gradually from the highest to the lowest degree.
- 2- Deduction of (27%) of higher sample members who got the highest degrees to represent the highest degrees and deduction of (27%) of the lower one to represent members of lower degrees. Higher group contained 81 players and the same number for lower one.
- 3- Finding discriminatory factor for each item using the T-test

Table (6) arithmetic means, standard deviations and counted T values for higher, lower groups and their significance to scale items.

Item No.	Higher marks		Lower marks		T counted value	Error	significance
	Mean	S.D	Mean	S.D			
1	5.000	0.000	2.252	0.857	34.242	0.000	Distinct
2	5.000	0.000	2.157	0.812	37.385	0.000	Distinct
3	5.000	0.000	1.930	0.803	40.832	0.000	Distinct
4	5.000	0.000	2.296	0.805	35.851	0.000	Distinct
5	5.000	0.000	2.252	0.826	35.540	0.000	Distinct
6	5.000	0.000	2.722	0.600	40.514	0.000	Distinct
7	5.000	0.000	2.835	0.457	50.532	0.000	Distinct
8	5.000	0.000	2.887	0.454	49.659	0.000	Distinct
9	5.000	0.000	2.713	0.574	42.557	0.000	Distinct
10	5.000	0.000	2.878	0.462	49.072	0.000	Distinct
11	4.896	0.307	1.730	0.680	45.320	0.000	Distinct
12	4.939	0.240	1.104	0.307	105.039	0.000	Distinct
13	4.174	0.819	1.000	0.000	41.363	0.000	Distinct
14	5.000	0.000	1.713	0.803	43.698	0.000	Distinct
15	5.000	0.000	2.887	0.318	70.940	0.000	Distinct
16	5.000	0.000	3.139	0.674	29.483	0.000	Distinct
17	5.000	0.000	2.235	0.831	35.543	0.000	Distinct

18	5.000	0.000	3.139	0.687	28.929	0.000	Distinct
19	5.000	0.000	3.017	0.418	50.583	0.000	Distinct
20	5.000	0.000	2.287	0.856	33.841	0.000	Distinct
21	4.991	0.093	1.209	0.408	96.465	0.000	Distinct
22	5.000	0.000	2.322	0.812	35.233	0.000	Distinct
23	5.000	0.000	2.313	0.872	32.891	0.000	Distinct
24	5.000	0.000	2.278	0.801	36.292	0.000	Distinct
25	5.000	0.000	2.183	0.844	35.651	0.000	Distinct
26	5.000	0.000	2.365	0.787	35.732	0.000	Distinct
27	5.000	0.000	2.443	0.703	38.813	0.000	Distinct
28	5.000	0.000	2.061	0.851	36.872	0.000	Distinct
29	5.000	0.000	2.835	0.438	52.793	0.000	Distinct
30	5.000	0.000	2.983	0.662	32.536	0.000	Distinct
31	5.000	0.000	1.739	0.807	43.163	0.000	Distinct
32	4.896	0.307	2.226	0.859	31.245	0.000	Distinct
33	5.000	0.000	2.200	0.829	36.050	0.000	Distinct
34	5.000	0.000	2.548	0.775	33.779	0.000	Distinct
35	5.000	0.000	2.870	0.363	62.618	0.000	Distinct
36	5.000	0.000	1.870	0.822	40.658	0.000	Distinct
37	5.000	0.000	1.809	0.837	40.728	0.000	Distinct
38	4.739	0.441	1.000	0.000	90.522	0.000	Distinct
39	5.000	0.000	2.765	0.535	44.579	0.000	Distinct
40	5.000	0.000	2.043	0.831	37.973	0.000	Distinct
41	5.000	0.000	2.061	0.809	38.800	0.000	Distinct
42	5.000	0.000	2.722	0.586	41.538	0.000	Distinct
43	5.000	0.000	2.930	0.645	34.253	0.000	Distinct
44	4.678	0.469	1.165	0.373	62.579	0.000	Distinct
45	5.000	0.000	3.470	0.705	23.182	0.000	Distinct
46	5.000	0.000	3.478	0.680	23.898	0.000	Distinct
47	5.000	0.000	1.270	0.446	89.370	0.000	Distinct
48	5.000	0.000	1.296	0.458	86.295	0.000	Distinct
49	5.000	0.000	2.835	0.687	33.633	0.000	Distinct
50	5.000	0.000	3.096	0.621	32.748	0.000	Distinct
51	5.000	0.000	2.000	0.806	39.757	0.000	Distinct
52	5.000	0.000	1.809	0.815	41.789	0.000	Distinct
53	5.000	0.000	2.287	0.856	33.841	0.000	Distinct
54	5.000	0.000	2.496	0.852	31.385	0.000	Distinct

55	5.000	0.000	3.243	0.630	29.790	0.000	Distinct
56	5.000	0.000	2.183	0.864	34.803	0.000	Distinct
57	5.000	0.000	3.409	0.605	28.062	0.000	Distinct
58	4.983	0.131	2.313	0.862	32.685	0.000	Distinct
59	5.000	0.000	3.330	0.780	22.840	0.000	Distinct
60	5.000	0.000	1.748	0.793	43.788	0.000	Distinct

2- Content Validity:

Content validity coefficient is used to determine items consistency in measuring behavioral phenomena. This factor shows correlation between each item and total mark of the scale. The researcher used Pearson correlation coefficient rule to extract the correlation between sample elements (300 players) on each item using the Statistical Package for the Social Sciences (SPSS). After comparing the correlation coefficient with significance values, it was shown that all items of measurement are statistically significant.

Table (7): Content Validity Coefficient

Item No.	Correlation coefficient	Significance values	Significance level	Item No.	Correlation coefficient	Significance values	Significance level	Item No.	Correlation coefficient	Significance values	Significance level
1	**184	0.000	Significant	2	**214	-07E3	Significant	3	**183	-05E1	Significant
4	**200	-06E2	Significant	5	*107	-02E1	Significant	6	**205	-07E8	Significant
7	*093	-02E3	Significant	8	*106	-02E1	Significant	9	**213	-07E3	Significant
10	**161	-04E1	Significant	11	**148	-04E4	Significant	12	*100	-02E2	Significant
13	**244	-09E4	Significant	14	**129	-03E2	Significant	15	**147	-04E5	Significant
16	**163	-05E9	Significant	17	**169	-05E5	Significant	18	**275	-11E3	Significant
19	**152	-04E3	Significant	20	**115	-03E6	Significant	21	**123	-03E3	Significant
22	**148	-04E4	Significant	23	*087	-02E4	Significant	24	*096	-02E2	Significant
25	**109	-02E1	Significant	26	**142	-04E7	Significant	27	**125	-03E3	Significant
28	*086	-02E4	Significant	29	**166	-07E5	Significant	30	**192	-06E4	Significant
31	*106	-02E1	Significant	32	**179	-05E2	Significant	33	**153	-02E3	Significant
34	*090	-02E3	Significant	35	*091	-02E3	Significant	36	**345	0.000	Significant
37	**291	0.000	Significant	38	**315	0.000	Significant	39	*168	0.046	Significant
40	**226	0.007	Significant	41	**168	0.000	Significant	42	*175	0.037	Significant
43	**323	0.000	Significant	44	**228	0.006	Significant	45	**212	0.000	Significant
46	**297	0.000	Significant	47	**239	0.004	Significant	48	**148	-05E4	Significant
49	**213	-04E3	Significant	50	**163	-05E4	Significant	51	**291	0.000	Significant
52	**129	-05E2	Significant	53	**115	-04E2	Significant	54	**205	-04E6	Significant
55	**343	0.000	Significant	56	**315	0.000	Significant	57	**149	-02E4	Significant
58	**160	-04E7	Significant	59	**143	-04E2	Significant	60	**162	-05E6	Significant

Scale Consistency:

Test consistency is considered one of the important psychometric features because it refers to items consistency in what is measured in an accepted degree of accuracy. The researcher ensured consistency of the Neurological Linguistic Programming (NLP) scale through the split-half and alpha Cronbach methods.

Split-Half Method:

It is one of the most used methods of reliability because it avoids the defects of some methods such as retesting. This method saves time and effort and measures consistency among items as this refers to how consistent the performance of respondents is on all items. The researcher used the relation between single and double questions to find reliability based on the data of the main sample of the trial (300 forms). The researcher also used the Statistical Package for the Social Sciences (SPSS) and entered data from it, and then items of Neurological Linguistic Programming (NLP) scale were divided into two parts between single and double items. Correlation coefficient between both rows was 0.83, but this represents half of the test, so it should be modified on the coefficient of the entire test. The researcher used the Spearman – Brown formula ($1+r/2r+1$) to correct the coefficient to be (0.91) which is high consistency that can be depend on to estimate test reliability.

Alpha Cronbach Coefficient:

This type of reliability is called internal consistency which is one of the most common and appropriate coefficients to graded scales. It refers to strength of correlations among scale items. To count reliability using this method in the Neurological Linguistic Programming (NLP) scale, the researcher used the sample of 300 players and counted coefficient value to reach (92.13) which is a very high reliability coefficient that can be used to estimate test reliability.

Exploratory Trial:

It is to explore conditions surrounding the phenomenon that the researcher wants to study. It is also considered a practical exercise to determine positive and negative sides facing him during tests to treat them. After finishing the scale’s final formula, inserting instructions, assessment balance, he performed the exploratory trial on a sample of study community (24 players). The researcher asked sample members to write down their observations on items that were not understood. After discussing items and instructions with exploratory sample members, it was found that they are understood and do not need modification. The answer time ranged between 20 and 30 minutes. The exploratory trial was performed on Saturday 15/03/2014 at 4:00 pm.

Main Trial of the Scale: (Surveying Study)

After the scale of Neurological Linguistic Programming (NLP) with its 60 items became ready to apply on the sample (300 premier league football club players) out of a total of 381 players, for statistical analysis of scale items, choosing valid and eliminating invalid ones based on the discriminatory ability (and the two extreme groups method and content validity), the researcher seeks to extract indicators of reliability and validity of the scale. Allam said that test and scale should contain some basic psychometric characteristics such as its validity and reliability. The scale was applied on the construct value in the period from 17/03/2014 to 29/04/2014.

3. RESULTS, ANALYSIS AND DISCUSSION

Factorial Analysis:

Factorial validity is one of the important indicators that can be used to study complex phenomena and extract factors affecting them through analyzing correlation coefficients between variables of the phenomenon. In addition, factorial analysis determines the main contents of phenomena subject to measurement and it is considered one of the most important statistical indicators of finding internal consistency (Keats, 1967).

The researcher used this method to determine the efficiency of scale items in their ability to measure the study sample and contents of Neurological Linguistic Programming (NLP) concept and whether it has one or more related fields. Therefore, 60 items of factorial analysis were inserted through 300 forms (answer papers). Factorial analysis resulted in 12 factors that vague unless being processed so the researcher used the Varimax method by Kaiser because it leads to the best solutions related to characteristics of simple construction.

Table (8): Arithmetic means and standard deviation values of Neurological Linguistic Programming (NLP) scale

Serial	Item code	Mean	S.D	Serial	Item code	Mean	S.D
1	X1	3.947	1.1952	31	X31	3.747	.7688
2	X2	3.873	1.1981	32	X32	4.720	.6133
3	X3	3.820	.9647	33	X33	4.643	.5921
4	X4	3.923	.7828	34	X34	4.770	.5144
5	X5	3.560	.8136	35	X35	4.823	.4156
6	X6	3.440	.7128	36	X36	4.550	.6498
7	X7	3.713	.7788	37	X37	4.543	.6755

8	X8	3.820	.7412	38	X38	4.680	.5585
9	X9	3.750	.7807	39	X39	4.663	.5696
10	X10	3.337	.6038	40	X40	4.647	.5623
11	X11	4.617	.7057	41	X41	4.543	.6853
12	X12	3.850	.6849	42	X42	4.540	.6080
13	X13	3.777	.6745	43	X43	4.690	.5430
14	X14	3.703	.8109	44	X44	4.490	.7292
15	X15	3.737	.6234	45	X45	4.650	.5614
16	X16	4.783	.4587	46	X46	4.600	.6388
17	X17	3.810	.6699	47	X47	4.650	.6235
18	X18	3.800	.6594	48	X48	4.557	.7497
19	X19	3.623	.6294	49	X49	4.660	.6577
20	X20	3.750	.7678	50	X50	4.543	.7233
21	X21	3.840	.6995	51	X51	4.713	.5020
22	X22	3.997	.5812	52	X52	4.693	.4968
23	X23	3.787	.5907	53	X53	4.660	.6525
24	X24	3.830	.5907	54	X54	4.660	.5587
25	X25	3.660	.7657	55	X55	4.637	.6372
26	X26	3.673	.8616	56	X56	4.063	.7624
27	X27	3.857	.7334	57	X57	3.790	.8133
28	X28	3.900	.8240	58	X58	3.760	.7240
29	X29	3.757	.7343	59	X59	3.750	.7590
30	X30	3.907	.8948	60	X60	3.823	.7708

Factorial Analysis of the Inetr-Linkages Matrix:

The factorial analysis of the study starts with the complete correlation matrix of the study variables and ends with the brief factorial matrix. Results of correlations are collected, summed and divided into coefficients. As a result, the scale is briefed to a small number of shared coefficients or features that are called the main fields of the phenomenon to be measured by the scale. The researcher extracted the inter-linkages matrix for 60 items and resulted in 1770 correlations as the study sample members were 300, so correlation coefficient values ranged between 0.502 and 0.926.

Factors before Processing

The factorial analysis resulted in finding 12 factors called direct factors that are hard to be psychologically explained unless after processing them. Although factorial construct is technically intact, it is hard to explain and the purpose of processing is to get simple factorial construct.

Factors after Processing

After processing using the Varimax method, the researcher determined factors that can be explained based on saturation of items as (+50) saturation was the minimum of accepting items and factors saturating three or more items equaling or more than (+50). The researcher has the right to chose the increased test and its saturation is equal to (0.50 – 0.30). Four factors were accepted to constitute Neurological Linguistic Programming (NLP) scale for football players and the fifth and sixth factors were eliminated for not complying with factor acceptance conditions.

Table no. (9) shows initial factors matrix after processing with numbers of items saturated with factors.

Factors									
Serial	Factor1	Factor2	Factor3	Factor4	Serial	Factor1	Factor2	Factor3	Factor4
X1		0.830			X31			0.908	
X2				0.633	X32				
X3					X33	0.790			
X4	0.570				X34			0.866	
X5		0.507			X35			0.903	
X6	0.518				X36		0.735		
X7	0.755				X37				0.926
X8			0.699		X38				
X9					X39			0.727	
X10				0.511	X40	0.611			
X11					X41				
X12	0.892				X42				0.811
X13			0.690		X43				
X14		0.763			X44			0.922	
X15		0.521			X45				
X16				0.602	X46	0.672			
X17	0.729				X47	0.831			
X18					X48				0.788
X19		0.543			X49				
X20					X50				
X21		0.694			X51		0.613		
X22	0.836				X52				
X23					X53				0.709
X24			0.789		X54				
X25					X55				
X26					X56				
X27		0.689			X57				
X28				0.652	X58				
X29	0.601				X59			0.890	
X30			0.590		X60	0.502			

Final Form of the Scale

After completing statistical processing, application and explanation of man conditions, the researcher found four dimensions representing components of Neurological Linguistic Programming (NLP) scale for applying football players including 39 items and table (10) shows the final formula of the scale.

Table (10): final scales after factorial analysis with dimensions, items and correction key representing Neurological Linguistic Programming (NLP) scale:

Personal Distinction						
Serial	Items	Applies on me very much	Applies on me much	Applies on me fairly	Does not apply on me fairly	Does not apply on me at all
1	I improve my skills to be distinct in my game	5	4	3	2	1
2	I feel difficulty in performing some skills in my game	1	2	3	4	5
3	I work harder than partners to achieve personal distinction in field	5	4	3	2	1
4	I feel it easy to perform distinct skills and difficult moves in the match	5	4	3	2	1
5	I improve my skill that makes me feel success and distinction	5	4	3	2	1
6	I can achieve personal goals that I want to achieve in the match	5	4	3	2	1
7	I use my utmost abilities to win	5	4	3	2	1
8	I can change my way of thinking and performance in the field	5	4	3	2	1
9	I feel easy to perform distinct skills and difficult moves in the match	5	4	3	2	1
10	I feel unable to own and perform distinct skills	1	2	3	4	5
11	I can overcome and beat opponents easily during the match	5	4	3	2	1
12	I am able to show high level during playing	5	4	3	2	1
Success Strategies						
Serial	Items	Applies on me very much	Applies on me much	Applies on me fairly	Does not apply on me fairly	Does not apply on me at all
13	I do my best to beat opponents in the match	5	4	3	2	1
14	I do my best to achieve success	5	4	3	2	1
15	I compete hard with others	5	4	3	2	1
16	I overcome difficulties and obstacles in the match	5	4	3	2	1
17	I seek to win all competitions	5	4	3	2	1
18	I make better performance than my previous one	5	4	3	2	1
19	I feel that my performance level is advancing	5	4	3	2	1
20	I make others feel that I am the best in the match	5	4	3	2	1
21	I show my utmost abilities in playing	5	4	3	2	1
22	I feel that I am the best player in the match	5	4	3	2	1

Role of Subconscious Mind						
Serial	Items	Applies on me very much	Applies on me much	Applies on me fairly	Does not apply on me fairly	Does not apply on me at all
23	I perceive myself as a winner in all matches	5	4	3	2	1
24	I feed my mind with positive thoughts	5	4	3	2	1
25	I can do everything through my subconscious mind strength	5	4	3	2	1
26	I am unable to change my negative thoughts	1	2	3	4	5
27	I can read others' minds well	5	4	3	2	1
28	I reject fear from myself by positive self-simulation	5	4	3	2	1
29	I repeat positive phrases with myself after ending training or the match	5	4	3	2	1
30	I can think positively before the match	5	4	3	2	1
31	I think that I am in my best condition during the match	5	4	3	2	1
Determining and Achieving Goals						
Serial	Items	Applies on me very much	Applies on me much	Applies on me fairly	Does not apply on me fairly	Does not apply on me at all
32	I use my available information and experience to determine my goal	5	4	3	2	1
33	I am not responsible for not achieving players' goals	1	2	3	4	5
34	One of my abilities' requirements is helping my trainers to achieve the highest performance level	5	4	3	2	1
35	I set training goals for myself	5	4	3	2	1
36	I feel that hard obstacles can stop me from achieving goals	1	2	3	4	5
37	I set special goals for myself that make me feel challenging and joy	5	4	3	2	1
38	I feel that my exercises are useless	1	2	3	4	5
39	I prefer challenging goals considering risks to be achieved	5	4	3	2	1

4. Conclusions:

Through discussing results of the sample of the study, the researcher concluded the following:

- 1- The researcher found the tool of measuring Neurological Linguistic Programming (NLP) concept for football players. In the light of factorial analysis, 4 factors were extracted to measure Neurological Linguistic Programming (NLP).
- 2- Neurological Linguistic Programming (NLP) is an integrated process including dimensions that must be found for achieving the hoped results.

Recommendations:

- 1- Using Neurological Linguistic Programming (NLP) scale designed by the researcher as one of the indicators to measure Neurological Linguistic Programming (NLP) for applying football players.
- 2- Providing psychological specialists in Iraqi clubs to help players overcome their problems and motivate them achieve in sports.
- 3- Legalizing the scale designed by the researcher by other researchers and post-graduate students.

5. References:

- Al Feky, I. (2008): "Neurological Linguistic Programming (NLP) and Unlimited Communication Art", Egypt, Cairo, Ibdaa Press.
- Abdelkhalik, A. M. (1989): "Personality Intelligence", 2nd Ed. Alexandria: Dar Al Maarefa Al Gaameya.
- Awda & Malakawy & Ahmed Mohamed (1987): "Basics of Scientific Research in Education & Human Science", Amman, Al Manar Library for Publishing & Distribution.
- Al Hallol, Ismail. (2011): "the Effect of Using Neurological Linguistic Programming (NLP) in Improving Achievement Motivation for Palestinian Teachers" Magazine of Jerusalem Open University for Studies and Research, Issue#: 22nd.
- Hanna, A. (2001): "Building and Legalizing a Scale for Psychological Burnout for Handball Players", PhD Dissertation, Faculty of Physical Education, Baghdad University.
- Mahdy, A. (1988): "Measuring Emotional Balance for Middle Stage Teachers", Master Thesis, Basra University, Faculty of Education.
- McDemout, I. & Wefry Gagu (2004): "Trainers of Neurological Linguistic Programming (NLP)", K.S.A, Garir Library.
- Elwan, H. (2001): "Building Self Concept Scale and Legalizing it on Premier and First Division Handball Players in Iraq", PhD Dissertation, Faculty of Physical Education, Baghdad University.
- Kharbet & Dawod (1992): "Ways of Designing Testing & Measurement Batteries in Physical Education", Basra University, Dar Al Hekma.
- Malthon, R. (2010): "Neurological Linguistic Programming (NLP)", Egypt, Cairo, Dar AlmKholoud for Heritage.
- Melhem, Sami. Mohamed (2000): "Measurement and Evaluation in Education & Psychology", Amman, Dar Al Maysar, 1st Ed.
- Galal, S. (1985): "Psychological Measurement (Tests & Scales)", Cairo, Daar Al Fikr Al Araby.
- Farag, S. (2007): "Psychological Measurement", 6th Ed. Egypt, Cairo, The Anglo-Egyptian Library.
- Allam, S. (1986): "Contemporary Developments in Psychological and Educational Measurement", Kuwait.
- El Zawbay, A. I. et al (1984): « Psychological Tests and Scales », Al Mosel University.
- Kadhem, A. M. (1994) : "Building a Legalized Scale for Personality Features of Preparatory Stage Students in Iraq", PhD Dissertation, Ibn Roshd Faculty of Education, Baghdad University.
- Shehada, O. M. (2013): "A Scale for Integrated Quality Management as one of the Indicators to Classify Sporting Institutions Clubs in Iraq", PhD Dissertation, Diali University, Faculty of Basic Education.
- Saleh, K. M. et al. (2000) : « Evaluation & Measurement », Tripoli, Tobrog University.
- Al Tikriti, M. (2003): "Unlimited Horizons", 5th Ed. Syria, Al Moltaqa for Publication & Distribution.
- Hussein, M. A. (2008): "Four Teaching Proofs for the Successful Teacher", 1st Ed, Dar Alm Olom for Publication & Distribution.
- Alm Hashemy, M. Y. (2006): "Neurological Linguistic Programming (NLP) and Psychological Effect of Colors", Jordan, Al Ahleya for Publication.
- Abulnin, M. E. (1986): "Factorial Analysis for Man's Intelligence and Abilities", Beirut, Dar Al Nahda Al Arabeya.
- Tasabehgy & El Nagggar, M. (2004): "Neurological Linguistic Programming (NLP)", Damascus, Syria.
- Allen, M. J., & Yen, W. M. (1979). Introduction to measurement theory. Monterey, CA: Brooks/Cole.
- Keats, J.A. (1967). "Test theory". Annual Review of Psychology 18: 217-238.

Address for correspondence

Author : Alaa Zohear Moustafa - Dialy University, Faculty of Physical Education

E-mail address : alaa_zohear@yahoo.com

DISORDERED EATING: PREVALENCE IN SPORTS AND ORAL MANIFESTATIONS: A REVIEW

Antina Schulze DDS* & Martin Busse MD, PHD*

*, ** *General Outpatient Ambulance and Sports Dentistry of the Institute of Sports Medicine, University of Leipzig, Germany*

Abstract

The purpose of this review is to compare recent studies and to describe the presence of disordered eating, its complications, and oral erosive manifestations in athletes and normal subjects. Caloric restriction caused by diet or excessive exercise is an increasing trend and has significant health consequences. Disordered eating can lead to adverse effects on health and physical performance. Several personality characteristics have been claimed to be associated both with eating disorders and sport participation: competitiveness, concern about performance, body shape and perfectionism. Although eating disorders are mostly diagnosed in women, their prevalence among males is thought to have been increasing in recent years (e.g. body builders, weight lifters). But also non-professional performers of sports emphasizing thinness or muscularity, show a high degree of inappropriate eating behaviors. Many studies reported higher prevalence of disordered eating in athletes and in women, other studies, in contrast, found no significant differences between athletes and controls. This heterogeneity of the studies was the reason for this review. The major intention was to focus on the high-risk groups for disordered eating, and to outline oral complications affecting the hard (dental erosion) and soft tissues. Athletes are at greater risk of dental caries, dental erosion and traumatic injuries. The level of oral health is often described as poor. Possible causes include the diet/disordered eating, consumption of carbonated beverages, lemon, and sports drinks, decreased salivary flow during exercise, exercise-induced immune suppression.

Keywords: Prevalence. Disordered. Eating. Sport. Oral.

Disordered eating

Disordered eating is described as a spectrum of abnormal eating patterns, including bingeing, purging, food restriction, prolonged fasting, use of diet pills, diuretics, and laxatives, and other abnormal eating behaviors.

Disordered eating (DN) occurs on a continuum from dieting and restrictive eating, abnormal eating behavior, and finally clinical eating disorders (1). The term eating disorder includes anorexia nervosa (AN), characterized by a conscious dietary restriction with consequent loss of weight, and bulimia nervosa, characterized by binge eating followed by purging (self-induced vomiting). The eating binges are planned and occur when the individual is stressed and feels out of control (2,3).

Both are psychosocial pathological eating disorders. An intense preoccupation with food, weight and a distorted body image coupled with a morbid fear of becoming obese are common elements in both syndromes. Self-starvation with extreme weight loss is associated with anorexia nervosa. Bulimia nervosa is characterized by unrestrained eating sprees followed by purging, fasting or vomiting. Approximately 50% of anorexia nervosa patients also practice bulimia (4).

In both AN and BN there are restricting- and binge/purging categories. If someone does not meet all the strict criteria for AN or BN, but their behaviors or eating symptoms compromise the individual's physical or psychological health-, and/or interfere with everyday activities, they might meet the criteria for EDNOS (5). EDNOS, short for eating disorder not otherwise specified, is considered to be present when one or more criteria for AN or BN are not present or lack the required duration or frequency. Persons who meet the criteria for EDNOS often have a "normal" body weight, but they are focused on body image, weight, and guilt surrounding eating. It is important to observe that athletes suffering from BN also usually have a "normal" body weight (5).

Perfectionism appears to play an important role among patients with an eating disorder. The personality of both, those with anorexia nervosa (AN) and bulimia nervosa (BN), is thought to be intrinsically perfectionistic, which suggests a need to understand the role perfectionism plays in the development, course and outcome of these disorders (6). According to Slade (7), body image has been defined as “the picture we have in our minds of size, shape and form of our bodies, and our feelings concerning characteristics and our constituent body parts”. Hilde Bruch (8) emphasized body image disturbance as a core feature of AN; this observation has been confirmed later and extended to other eating disorders, being now a relevant criterion for their diagnosis (9). Nevertheless, disturbances of body size estimation are not limited to eating-disordered persons. Cultural pressure toward thinness has a strong influence on body image, so that the cultures that emphasize thinness have the highest prevalence of eating disorders (10-14).

Disordered eating in sports

There is an increased focus on perfectionism among athletes and on its relationship to the higher prevalence of eating disorders in this group (6). For many athletes, it is desirable to have a high lean body mass and a low body fat mass to achieve a high power-to-weight ratio.

Athletic participation has often been linked to a higher prevalence of eating disorders, which are found to be particularly widespread among performers of certain types of sports or physical activities, such as ballet (15-20), gymnastics (21-23), running (24-26) and skating (27,28).

Several personality characteristics have been claimed to be associated both with eating disorders and sport participation: competitiveness, concern about performance, compulsive concern about body shape and perfectionism (29). In addition to dieting, further important risk factors are: personality factors, pressure to lose weight, frequent weight cycling, early start of sport-specific training, overtraining, injuries, and unfortunate coaching behavior (1).

Relationships between athletes, abnormal eating behaviors, and eating problems have been demonstrated through the development of specific terms including weight cycling, anorexia athletica, and the female athlete triad (22, 30-36).

Female athlete triad (first described in 1992 by the American College of Sports Medicine) includes disordered eating, amenorrhea, and osteoporosis. Low energy availability from either dietary restriction or increased expenditure plays a central role in the development of the triad.

In trying to understand this complicated problem, one must grasp the concept that the three pathologies are interrelated and difficult to explain when the influence of any of the other components is missing (37). Disordered eating is linked to menstrual irregularities because caloric restriction or energy imbalance contributes to metabolic disturbances, such as irregular secretion of luteinising hormone (38, 39), oestrogen deficiency and other hormonal changes, which are involved in the regulation of the menstrual cycle (40). Oestrogen deficiency has been implicated as a primary cause of osteopenia in amenorrhic athletes (41). Thus, athletes with menstrual irregularities during their late teens or early adulthood may fail to reach peak bone mass (42), exposing them to the risk of osteoporosis and osteopenia later in life. But osteoporosis is not always caused by menstrual irregularity. Energy restriction may also lead to a lower bone mineral density (43). Prevention of osteoporosis as well as stress fractures and other considerable medical consequences is also critical, especially among women participating in sports that emphasize a lean physique and in weight-restricting sports such as gymnastics and competitive martial arts (44).

Although eating disorders are mostly diagnosed in women, their prevalence among males is thought to have been increasing in recent years (45). Different studies have been performed in order to evaluate the prevalence of eating disorders among males, especially athletes, and some authors described a new clinical feature, firstly known as “reverse anorexia” (46) and recently renamed into “muscle dysmorphia” (47,48), which is thought to affect about 8 to 9 percent of male body builders and weight lifters. Its main feature is an altered body size perception that leads to an underestimation of the muscles and the whole body development (48-50). These subjects, performing highly competitive sport and being in need of a firm control upon their body weight and shape, often undergo physical hyperactivity, unbalanced diets and use of anabolic drugs (51-54).

Eating disorders are multidimensional problems. An interdisciplinary team that involves coaches, athletic trainers, nutritionists, physicians, and sport psychologists will offer the best approach for prevention, identification, and treatment.

Prevalence

Among sportsmen, eating disorders have a higher prevalence of 23 to 25 percent (55) and it has been estimated that the prevalence of disordered eating in athletes ranges from 15 to 62 percent (56, 57)

There is an increased focus on perfectionism among athletes and its relationship to the higher prevalence of ED. Also perfectionism plays a role in the development, course and outcome of these disorders (6). The body uneasiness is not a consequence of physical activity, but it is related to the type of sport performed. In fact, as suggested by several authors, the drive for thinness, which is present in several types of sports and is strictly related to the performance (e.g. ballet), plays a role in influencing the perception of body shape (16, 58, 59). Athletes most at risk for ED are those involved in sports emphasizing a thin body size/shape, a higher power-to-weight ratio, and /or sports utilizing weight categories, such as in some high-intensity sports. In addition to dieting, important risk

factors are: personality factors, pressure to lose weight, frequent weight cycling, early start of sport-specific training, overtraining, injuries, and unfortunate coaching behavior (1).

Athletes who participate in lean and aesthetic sports (those that emphasize weight categories or aesthetics, such as ballet, gymnastics, or endurance running) are at higher risk for developing eating disorders than those doing sports that do not have such a focus on body or weight (31, 51, 60-66).

The prevalence of eating disorders is increased in elite athletes and for this group the cause of starting a diet is related to a.) the perception of the paradigm of appearance in the specific sport, b.) the perceived performance improvements, and c.) the sociocultural pressures for thinness or an "ideal" body (1).

Disordered eating (DE) in athletes is characterized by a wide spectrum of maladaptive eating and weight control behaviors and attitudes. These include concerns about body weight and shape, poor nutrition or inadequate caloric intake, or both, binge eating, use of laxatives, diuretics, and diet pills; and extreme weight control methods, such as fasting, vomiting, and excessive exercising (67-70).

Many studies have showed a higher prevalence among athletes compared with controls (29, 31, 71). Two large, well-controlled studies reported the prevalence of eating disorders among female athletes, range from 20 to 22 percent as compared to 5.8 to 9.0 percent in the normal population (31, 62).

Disordered eating and related weight control behaviors, such as excessive exercising and restrictive eating, represent serious health problems for girls and women in the US and other industrialized nations (72). Walsh et al. (73) found out that 95% of patients with anorexia nervosa are female. The prevalence has been estimated to be about 1% in adolescent girls, although it may be subclinical in up to 10% of young women aged 16 to 25. Other risk factors for anorexia nervosa include being a middle- to upper-class female, participation in activities valuing thinness (ballet, gymnastics, modeling) and a family history in ED. An episode of anorexia nervosa is typically precipitated by a stressful situation. The estimated prevalence of bulimia nervosa is 3 to 10 percent of adolescent and college age women in the US (73). Other showed disordered eating in young females ranging from 13 to 30 years. Anorexia nervosa (AN) ranges from 0.5 to 2 percent, Bulimia nervosa (BN) from 1 to 3 percent and eating disorders not otherwise specified (EDnos) from 2 to 13 percent (9, 70).

The prevalence of disordered eating is higher in adolescent elite athletes than in controls and higher in female than in male athletes (74). Many female athletes exhibit DE patterns. Although these athletes may not meet criteria for anorexia nervosa or bulimia nervosa and typically do not have disturbances in body image, behaviors and complications similar to those seen in full-blown eating disorders are seen. A marked prevalence in women relative to men (F:M ratio of 10:1), the average age for anorexia of 16 years and a later presentational age of 25 for bulimia nervosa was found (75, 76).

Prevalence research supports the contention that female athletes are at risk for developing eating disorders (31, 60, 77-79). These studies suggested that female athletes a.) in general experience clinical eating disorders and even higher levels of subclinical problems, and b.) may be particularly at risk in sports that are identified as aesthetic (gymnastics) and/ or lean (swimming).

Anderson & Petrie (61) based their study on a geographically diverse group of female collegiate athletes from two sports, swimming/diving and gymnastics, and they found rates of clinical (6.3 %) and subclinical (26.1 %) disordered eating. Their results were slightly higher than reported in previous studies with mixed sport samples of female collegiate athletes with reported prevalence rates for clinical disorders to be 2 to 5.7 percent and for subclinical levels to be 14.5 to 25.5 percent (61, 77, 78, 80, 81).

Amenorrhea, both primary and secondary, is more common in female athletes than in their more sedentary peers. The female athlete triad is more common in appearance- and endurance-based sports such as gymnastics, ballet, and long-distance running. It also seems to be more common in athletes who are training seriously and who have an over-controlling parent or coach. Estimates of the prevalence of disordered eating in athletes range from 15 to 62 percent, and amenorrhea may occur in 3 to 66 percent of the athletes (56, 57).

Female athletes have been identified as a subgroup to study because of the unique weight, performance, and body image pressures they experienced from coaches, teammates, fans, and judges. Such "sport-environment" pressures, when combined with general societal messages about the need to be thin and attractive, are thought to substantially increase female athletes' risk of developing disordered eating problems (82).

Although the extent of DE in athletes is unclear due to methodologic limitations of existing studies (primarily the lack of standardized assessment tools and consistent criteria for defining DE), prevalence estimates have ranged as high as 62% among female athletes and 33% among male athletes (29-31, 71, 83-90). Although large-scale studies of at-risk subgroups of athletes (31, 60) have been methodically sound and provided useful prevalence data, they have been limited in two important ways. First, these studies focused solely on elite/ Olympic-level athletes from one country. Thus, the generalizability of the findings is limited and little is known about other levels of sport participation, such as college-level athletes. Second, their prevalence data were determined based on either the entire sample (vs. controls) or large subgroups of sports, such as lean, aesthetic, or ball game. Thus, the prevalence data are not specific to one sport but rather to a group of sports purposed to have similar characteristics (61).

Disordered eating (ED) can lead to adverse effects on health and physical performance. Consequences of ED upon health and physical performance depend on the athlete's immediate health status, the demand of sport-specific training, the type, severity, and duration of the pathogenic weight control or eating behaviors, the degree of nutrient deficiency, the presence of comorbid physical and mental disorders, and the timing and quality of therapeutic interventions (31, 91, 92).

Coaches, sports medicine personnel, and sport psychologists need to be aware of that most female gymnastics, swimmers, and divers with an eating disturbance will be at the subclinical level and will not necessarily be underweight nor always "appear" to have a disorder (less than 2 % of the athletes in the study of Anderson & Petrie (61) were underweight in terms of their BMI). These disorders are also likely to occur equally across race/ ethnicity and school year (61).

Nevertheless, eating disorders usually go unnoticed unless the athletes themselves acknowledge their problem and seek medical help (93).

It is recommended that more attention may be placed on women participating in higher levels of competition, besides just those participating in the leanness sports.

But also non-professional performers of sports emphasizing thinness or muscularity, such as ballet and body-building, show a high degree of body uneasiness and inappropriate eating attitudes and behaviors (94).

Oral manifestations/ oral complications

Often the dental professionals are the first to discover and diagnose disordered eating by detecting the clinical dental and oral symptoms and consequently face the difficult task to motivate the patients, who often deny their illness, to seek psychiatric help and dental care. The patients are mostly embarrassed about their behavior and therefore highly secretive. Dental staff members often do not feel comfortable beginning a dialogue with patients who are suspected of having an eating disorder (95). Burkhart et al. (95) suggest a dialogue for approaching these patients and offer educational material to reduce further tissue destruction.

The difficulties of recognizing the oral manifestations, and the failure to do so, may lead to serious systemic problems in additions to progressive and irreversible damage to the oral hard tissues.

Detection requires awareness of risk factors, symptoms and signs of, anorexia nervosa (e.g. participation in activities valuing thinness, family history of an eating disorder, amenorrhea, lanugo hair) and bulimia nervosa (e.g. unsuccessful attempts at weight loss, history of childhood sexual abuse, family history of depression, erosion of tooth enamel from vomiting, parotid gland swelling, and gastroesophageal reflux (73)). The oral manifestations may vary in severity with the length of time the person has had the eating disorder, the degree and frequency of pathological eating behaviors, and the diet and oral hygiene.

Objective oral signs and symptoms of bulimia do exist and their presence can facilitate a diagnosis of bulimia during routine examination. The realization that five oral signs and symptoms of bulimia -- dental erosion, salivary gland enlargement, xerostomia, oral mucosa erythema, and cheilitis -- are associated with the disease can eliminate some laboratory tests as well as facilitate an earlier diagnosis of bulimia (96).

1. Dental erosion

Dental erosion is defined as the constant loss of the teeth hard tissues caused by chemical agents without the influence of a carious process or bacteria (97-99). The wear may cause the flattening of the occlusal surface and the loss of occlusal vertical dimension of the patient. Additionally, there may be shortening of anterior teeth, bringing serious consequences to the quality of life of the patient and preventing him from talking or smiling (100).

In general, root surfaces were more susceptible to erosion than enamel surfaces. This is expected because of compositional differences; enamel is approximately 95 % mineral and 5 % organic material while the root (i.e. cementum and dentin) has a lower mineral and higher organic content (101). The difference is clearly visible as enamel surfaces are almost completely eroded while the root surfaces retain an organic matrix (102).

Dental erosion is a multifactorial condition with many risk indicators. Medical condition including frequent mouth dryness, and having frequent bouts of vomiting or using a cortisol inhaler, dietary habits including consumption of carbonated beverages, lemon, sour candies, and sports drinks, keeping soft drinks in the mouth for a long time, brushing teeth following soft beverages or drinking lemon juice at bed time (103).

Erosion can be classified according to the criteria of Eccles and Jenkins (104). The following findings characterize an erosion: 1.) absence of development ridges on the enamel, resulting in a smooth glazed enamel surface; 2.) concavities in the cervical region on the labial enamel surfaces whose breadth greatly exceeded their depth, thus distinguishing them from cervical abrasion lesions; 3.) edges of amalgam restorations raised above the level of the adjacent tooth surface; 4.) depression of the cusps of posterior teeth, producing "cupping". In more severe cases, dentin is also involved.

Dental erosion can have extrinsic or intrinsic causes:

- A. Intrinsic causes include recurrent vomiting, regurgitation of gastric contents, low salivary flow.
- B. Extrinsic causes include demineralizing acidic foods (citrus fruits, acidic beverages), chewable vitamin-C tablets and iron tonics, frequent swimming in chlorinated pool water. (105).

Intrinsic dental erosions due to the frequent vomiting or gastroesophageal reflux

Dental erosion does not occur until gastric acid has acted regularly on the dental hard tissues over a period of several years. Dental erosion is caused by diseases which are associated with chronic vomiting or persistent gastroesophageal reflux over a long period, such as: disorders of the upper alimentary tract, specific metabolic and endocrine disorders, cases of medication side-effects and drug abuse, psychosomatic disorders, e.g. stress-induced psychosomatic vomiting, anorexia and bulimia nervosa or rumination (106). Brushing the teeth after a binge can worsen the problem, but rinsing with baking soda after vomiting seems to alleviate some of the acid-related complications (107-109).

Smooth erosion of enamel and permolysis (defined as a loss of enamel and dentine on the lingual surfaces of teeth) are a result of chemical and mechanical effects caused by stomach acid and chronic/ frequent self-induced vomiting and are activated by movements of the tongue. It is first seen on the palatal surfaces of the maxillary front teeth. The initially moderate demineralization or glassy erosion of the lingual surfaces of the maxillary teeth may enlarge, extending to the occlusal surfaces of posterior teeth and facial surfaces of maxillary, and, infrequently, mandibular teeth. A generalized erosion may lead to posterior teeth with outstanding amalgam restorations, to exposed and damaged dentine, even with visible pulps, resulting in teeth hypersensitive to temperature, chewing and brushing (110, 111) and to occlusal changes (anterior open bite, loss of vertical dimension (112).

Extrinsic dental erosions due to demineralizing acidic beverages and swimming in chlorinated pool water

Erosive potential of acidic beverages/sports beverages

Larsen et al. (113) of Denmark investigated the in vitro erosive potential of soft drinks, mineral waters and orange juices and compared erosion depths to the pH-value and buffering capacity of the beverage. They reported that erosion was minimal in beverages containing a pH-value above 4.2, but became more evident with pH-values decreasing below 4.0.

Rees et al. (114) reported that sports drinks based on acidic fruits popular in the United Kingdom have low pH-values, and are erosive when enamel is immersed in the sports drink. Sports beverages can produce substantial surface loss and surface softening (115). People with healthy lifestyles and athletes may consume acidic drinks, doing this frequently during low salivation conditions (physical training) or making excessive use of the same day by day, trying to keep body weight (98). An exaggerated intake of sports supplements (isotonics) may also cause gastroesophageal changes (116).

People with high consumption of acidic beverages, decreased salivary flow, prolonged beverage holding habits, or mouth breathing could be at an increased risk for dental erosion (102).

Frese et al. (117) observed no difference with regard to salivary parameters in endurance runners, but load-dependent changes in salivary parameters (after and at maximum workload, saliva flow rates decreased and saliva pH-value increased significantly) and an increased risk for dental erosion.

The nature of consumption (i.e. sipping for extended periods or concurrent with mouth breathing during athletic training) could increase the opportunity for erosion to occur (102). Rios et al. (118) reported an association between incisal tooth wear and mouth holding of beverages prior to swallowing in 6-year-olds from Brazil. Rios et al. also reported that brushing enamel immediately after exposing it to acidic beverages increased tooth loss (119).

Bryant et al. (120) reported about the risk factors for dental caries and erosion in elite triathletes in New Zealand. Sports drinks were consumed by 83.9 % of the triathletes while training; for 48.4 %, the consumption of both sports drinks and water was described as "little sips often, from a bottle". Eating during training session was reported by 93.5 % of the participants, of which 62.1 % only ate during cycling training. Only 3.2 % perceived training as a high risk to oral health. All clinical examination cases were assessed as a high risk for developing caries. The diet of elite triathletes is consistent with a high risk profile for caries and erosion.

Dental erosion/ tooth wear was also reported from Milosevic et al. (121) (swimming and cycling) and Needleman et al. (122) (Olympic sports) with no data from control populations. In the study of Bryant et al. (102) proportions of athletes with wear into dentine were high, ranging from 36 % to 85 % with only one study recording no wear.

Ehlen et al. (102) tested acidic beverages. The quantity of base required to neutralize the beverages upon opening was highest for energy drinks followed by regular and diet sodas and then 100 % juice and sports drinks. The quantity of base required to bring beverages to neutral after 60min of vigorous stirring was again highest for energy drinks followed by regular and diet sodas and then

100 % juice and sports drinks. The in vitro nature of the experimental design and artificial time of exposure are study limitations (102). The in vitro design exposes the tooth to the beverage for a defined time period without considering the rate of beverage consumption, length of swallow, movement within the mouth during swallowing, clearance by saliva and remineralization potential of saliva.

Järvinen et al. (123) detected a considerable risk of erosion when citrus fruits were eaten more than twice a day (37 times higher), soft drinks were drunk daily (4 times higher), apple vinegar was ingested weekly (10 times higher), or sport drinks were drunk weekly (4 times higher), in individuals who vomited once a week or more (31 times higher than vomiting not that often), or exhibited gastric symptoms (acid taste in the mouth, belching, heartburn, stomach-ache, gastric pain and awaking) once a week or more (10 times greater, each times respectively, than when the habit did not exist), and in those with a low unstimulated salivary flow rate (123). The demineralizing effect of citric acids is exceptionally great because its chelating action on enamel calcium continues even after the pH-value increased at the tooth surfaces (124, 125). For instance, consuming 350g of grapefruit juice each day for four weeks produced detectable changes in the enamel surface (126). Many soft drinks contain citric, phosphoric, carbonic, and other acids, and often have a pH-value of less than 4.0 (104, 127). Soft drinks, except those containing just carbonic acid, have been reported to cause dental erosion, both in case studies (104,128,129) and in vitro (130). In studies, sport drinks have turned out to be strongly erosive (130-132). Frequent consumption of pickles causes erosion in those eating lactovegetarian diets (133). The unstimulated salivary flow rate is an important factor determining whether dental erosion occurs (2, 134). A patient with an unstimulated salivary flow rate of 0.1 ml/min or less is at a 5 times higher risk of erosion than those with higher flow rates (123). At normal salivary flow rates, acidic drinks are eliminated from the mouth in about 10 min, and the pH-value at the tip of the tongue remains low for only some two min after the drink has been consumed (135). In contrast, in patients with low salivary flow rates, the pH-value remains low for about 30 min (136). Many such factors could be eliminated by general measures, such as increasing the availability of information about acidic products and gastric conditions, and through product development. It is important for erosion to be diagnosed at an early stage and to identify the risk factors. This increases the possibilities of successful treatment and reduces complications associated with mechanical intervention (123).

Due to the dental erosion risk, sports beverages should not be consumed in low salivation conditions during physical training or mouth breathing, not day by day, in no prolonged beverage holding habit, or little sipping often from a bottle. After the consumption the drinking of water is useful to increase the pH level. Sports beverages should have a pH-value higher than 4.2.

Erosive potential of swimming in chlorinated pool water

Savad (137) first reported that swimmers may be susceptible to acid erosion of enamel. Two other studies confirmed this suggestion (105, 138). Several reports indicate an increased prevalence of dental erosion among frequent swimmers due to low pH gas-chlorinated pool water. Contrary to other extrinsic factors which induce erosion located on the facial tooth surface, pool water with a low pH-value results in general dental erosion (138).

Swimming pools are chlorinated to reduce bacterial and algal contamination. There are several ways to add chlorine, which should preferably have a concentration of 2-3 ppm (minimum 1 ppm) (139). The pH-value of the water is then adjusted to about 7,5 by the addition of acid or alkali. Sources of chlorine are sodium hypochlorite, which has an alkaline pH-value and, has no potential to cause erosion in teeth (140); chlorine gas, which is used mainly in large public swimming pools; and "stabilized" chlorine, which is created by combining chlorine and the salts of cyanuric acid into a tablet form in a solution, chlorine generates hypochlorous and hypochloric acids, the former having disinfectant properties. Cyanuric acid retards the rate at which hypochlorous acid is broken down by sunlight. Unless the acids are neutralized, usually with sodium carbonate, the pH-value of the water may be less than 3 (105,138). A low pH-value may cause eye irritation and in contact with the teeth will cause irreversible erosion of the enamel (140).

In the study of Kaczmarek (141) each competitive swimmer spent 16-25 hours per week in the swimming pool and had more dental erosion than the control group. The erosion was mainly located on the labial surface of the maxillary incisors. The caries intensity was similar to the control. Baghele et al. (142) looked for the prevalence of dental erosion among young competitive swimmers in India. 90 % showed dental erosion, 94 % exhibited rough surfaces, directly proportional to the duration of swimming

Centerwall et al. (105) looked for dental erosion among competitive swimmer who swam in a gas-chlorinated swimming pool (pH-value of 2.7) and found erosion in 39 % of the swim team members. Geurtsen (138) described a very rapid occurrence of excessive general dental erosion at a competitive swimmer due to gas-chlorinated pool water that occurred within 27 days.

A regular pH-value monitoring of chlorinated swimming pool water is very important and it is recommended to fluoride the teeth of intense swimmers regularly to prevent dental erosion (138).

2. Parotid gland hypertrophy

The swelling is generally asymptomatic, painless and intermittent (108), the onset of swelling usually follows a binge-purge episode by 2 or 6 days (142). The mechanism of hypertrophy has been variously attributed to high carbohydrate intake or regurgitation of acid gastric contents. The unilateral or bilateral incidence is between 10 and 50 percent (143), and occasionally a swelling of the

mandibular gland can occur. Concerning the salivary chemistry, Tylanda et al. (142) found no differences in the concentrations of potassium, chloride, calcium, urea nitrogen or albumin between patients with bulimia nervosa and controls. There also was no evidence of olfactory dysfunction.

3. Salivary flow and xerostomia

Although apparently unrelated to gland hypertrophy there have been reports of reductions in unstimulated salivary flow rates in patients who binge eat and induce vomiting (142, 143). Vomiting and misuse of laxatives or diuretics cause a decreased total fluid volume in some patients, thus contributing to a diminished salivary flow and a possibly reduced buffering capacity and /or lowered pH-value (2, 144). Antidepressant drugs in the treatment of bulimia nervosa, as well as depression and anxiety, may also induce xerostomia (96). The reduction or loss of the salivary buffering capacity would likely contribute to the process of enamel erosion. The occurrence and the progression of dental erosion in this respect have been pointed out by various authors (106, 123).

Sanchez et al. (145) reported that children with erosion had lower salivary flow rates and buffering capacities than children without erosion.

4. Oral mucosa

The oral mucous membranes and the pharynx may be traumatized in patients who binge eat and purge, both by rapid ingestion of large amounts of food and by the force of regurgitation (146). Erythema of the palate, pharynx and posterior tongue, and traumatic pharyngeal tears may result from the use of fingers, combs, and pens, to induce regurgitation of the stomach contents. Dehydration and angular cheilitis have also been observed (146).

Poor oral hygiene is more common in anorectics than bulimic patients (147), -higher plaque indices and gingivitis are then likely clinical findings. Anorectics manifest less interest in oral hygiene, which is probably a result of the extremely serious nature of the anorectic psychopathology, particularly the distorted self-perception and body image (4, 75). Bulimic patients, apparently have a more realistic body image and are often so concerned about their appearance as to be scrupulous about their hygiene and oral care (4, 75). The loss of moisture and the protective properties of saliva can result in dehydration of the periodontal tissues, dietary vitamin and protein deficiency can exacerbate the situation (4). The development of caries is less predictable and appears to be dependent on the diet and oral hygiene.

General oral health in athletes

Athletes are at greater risk of dental caries, dental erosion and traumatic injuries (148). The poor level of oral health in athletes is not a new finding (149). Possible causes include the diet (120), use of sports drinks (150-152), decreased salivary flow during exercise (153), exercise-induced immune suppression (154), level of knowledge and beliefs related to oral health, difficulty of assessing oral health preventive care due to the availability of local services and prioritisation of time.

Ashley et al. (155) showed in their study that in contrast to the common perception that athletes are healthy "all over", the oral health of sampled athletes is poor. Caries occurred in up to 75 % of athletes surveyed. The examined athletes also experienced other oral problems such as periodontal disease, dental erosion and dental trauma. The oral health of athletes appears to be poor across a wide range of sports. Dental caries and dental erosion affected the majority of sampled athletes. Irreversible periodontitis affected up to 15 % of the participants (155).

Frese et al. (117) observed no difference with regard to caries prevalence, but an exercise dependent caries risk (correlation between caries prevalence and the cumulative weekly training time).

No studies compared data with either controls or population norms. Owing to this lack of comparative data, it is difficult to make any statements regarding the oral health of elite athletes relative to a non-athlete population. Data from control groups, or population norms, concerning prevalence of periodontal disease in athletes were not presented (155).

Oral and dental treatment

The major component in the therapy of disordered eating is psychological, with influences from the family, social, and even religious spheres (156).

the primary goal of dental care is to preserve the remaining teeth and to prevent further erosive loss of dental hard tissues. It is recommend to reduce the consumption of isotonic drinks, change the eating habits (no spicy and fatty foods, citrus fruits, coffee, tea, chocolate, alcohol, and soft drinks) and to get used to walks after eatings (157).

Palliation of pain and temporary cosmetic procedures, until the patient is adequately stabilized, are the first steps of dental treatment. The prognosis for dental treatment depends on the cessation of the binge eating and vomiting habit. Extensive restorative oral rehabilitation should be postponed until the underlying psychiatric components of the disorder are stabilized (4).

Initial dental care focuses on improved oral hygiene. The use of gastric acid-neutralizing antacid rinses and the daily application of topical fluorides can be useful in reducing enamel erosion (4). Calcium and fluoride have been shown to limit the extent of erosion by saturating the solution and/or altering the solubility of enamel (113,158-161).

Dental restorative therapy must be part of a combined medical and dental treatment plan and should not be started before the ED has been treated and the patients are considered to have stable prognosis. In view of the young age of the patients, the large extensions of the erosive lesions and in order to avoid endodontological treatment of mostly sound pulps, non-invasive restorative concepts using adhesive technology should be preferably used (162). Composite restoratives exhibit acceptable resistance to dissolution by acids and they are reversible.

References

1. **Sundgot-Borgen, J. & Torstveit, M.K. (2010).** Aspects of disordered eating continuum in elite high-intensity sports. *Scand J Med Sci Sports.* 20(Suppl. 2), 112-121.
2. **Hellström, I. (1977).** Oral implications in anorexia nervosa. *Scand J Dent Res.* 85, 71-86.
3. **Spigset, O. (1991).** Oral symptoms in bulimia nervosa. A survey of 34 cases. *Acta Odontol Scand.* 49(6), 335-339.
4. **Roberts, M.W. & Tylanda, C.A. (1989).** Dental aspects of anorexia and bulimia nervosa. *Pediatrician.* 16(3-4), 178-184.
5. **American Psychiatric Association (APA) (1994).** Diagnostic and statistical manual of mental disorders, 4th ed. Washington, DC: American Psychiatric Association. 539-550.
6. **Forsberg, S. & Lock, J. (2006).** The relationship between perfectionism, eating disorders and athletes: a review. *Minerva Pediatr.* 58(6), 525-536.
7. **Slade, P.D. (1988).** Body image in anorexia nervosa. *Br J Psychiatry.* 2, 20-22.
8. **Bruch, H. (1962).** Perceptual and conceptual disturbances in anorexia nervosa. *Psychosom Med.* 24, 187-194.
9. **American Psychiatric Association (2000).** Diagnostic and Statistical Manual of Mental Disorders, ed 4 text revision (DSM-IV-TR). Washington, American Psychiatric Association.
10. **Dorian, L. & Garfinkel, P.E. (2002).** Culture and body image in Western society. *Eat Weight Disord.* 7(1), 1-19.
11. **Jacger, B., Ruggiero, G.M., Edlund, B., Gomez-perretta, C., Lang, F., Mohammadkhani, P., Sahleen-Veasey, C., Schomer, H., Lamprecht, F. (2002).** Body dissatisfaction and its interrelations with other risk factors for bulimia nervosa in 12 countries. *Psychother Psychosom.* 71(1), 54-61.
12. **Fisher, S. (1986).** Development and structure of the body image. Hillsdale, Erlbaum.
13. **Cash, T.F & Pruzinsky, T. (1990).** Body images: Development, deviance and change. New York, Guilford Press.
14. **Thompson, J.K. (1995).** Assessment of body image. Allison DB (ed): Handbook of Assessment Methods for Eating Behaviours and Weight-Related problems. Thousand Oaks, Sage, 119-148.
15. **Abraham, S. (1996).** Eating and weight controlling behaviours of young ballet dancers. *Psychopathology.* 29(4), 218-222.
16. **Bettle, N., Bettle, O., Neumärker, U., Bettle, O. (1998).** Adolescent ballet school students: Their quest for body weight change. *Psychopathology.* 31(3), 153-159.
17. **Neumärker, K., Bettle, N., Neumarker, U., Bettle, O. (2000).** Age- and gender-related psychological characteristics of adolescent ballet dancers. *Psychopathology.* 33(3), 137-142.
18. **Le Grange, D., Tibbs, J., Noakes, T.D. (1994).** Implications of a diagnosis of anorexia nervosa in a ballet school. *Int J Eat Disord.* 15(4), 369-376.
19. **Abraham, S. (1996).** Characteristics of eating disorders among young ballet dancers. *Psychopathology.* 29(4), 223-229.
20. **Bettle, N., Bettle, O., Neumarker, U., Neumarker, K.J. (2001).** Body image and self-esteem in adolescent ballet dancers. *Percept Mot Skills.* 93, 297-309.
21. **Petrie, T.A. & Stoeber, S. (1993).** The incidence of bulimia nervosa and pathogenic weight control behaviours in female collegiate gymnasts, *Res Q Exerc Sport.* 64(2), 238-241.
22. **O'Connor, P.J., Lewis, R.D., Kirchner, E.M. (1995).** Eating disorder symptoms in female college gymnasts. *Med Sci Sports Exerc.* 27, 550-555.

23. **O'Connor, P.J., Lewis, R.D., Kirchner, E.M., Cook, D.B. (1996).** Eating disorder symptoms in former female college gymnasts: Relations with body composition. *Am J Clin Nutr.* 64, 840-843.
24. **Yates, A., Leehey, K., Shisslak, C.M. (1983).** Running - an analogue of anorexia? *N Engl J Med.* 308(5), 251-255.
25. **Weight, L.M. & Noakes, T.D. (1987).** Is running an analog of anorexia? a survey of the incidence of eating disorders in female distance runners. *Med Sci Sports Exerc.* 19(3), 213-217.
26. **Hulley, A.J. & Hill, A.J. (2001).** Eating disorders and health in elite women distance runners. *Int J Eat Disord.* 30(3), 312-317.
27. **Rucinski, A. (1989).** Relationship of body image and dietary intake of competitive ice skaters. *J Am Diet Assoc.* 89(1), 98-100.
28. **Garner, D.M., Rosen, L.W., Barry, D. (1998).** Eating disorders among athletes. Research and recommendations. *Child Adolesc Psychiatr Clin N Am.* 7(4), 839-857.
29. **Smolak, L., Murnen, S.K., Ruble, A.E. (2000).** Female athletes and eating problems: A meta-analysis. *Int J Eat Disord.* 27, 371-380.
30. **Sundgot-Borgen, J. (1994).** Risk and trigger factors for the development of eating disorders in female elite athletes. *Med Sci Sports Exerc.* 26, 414-419.
31. **Sundgot-Borgen, J. & Torstveit, M.K. (2004).** Prevalence of eating disorders in elite athletes is higher than in the general population. *Clin J Sport Med.* 14, 25-32.
32. **Drinkwater, B., Loucks, A., Sherman, R., Sundgot-Borgen, J., Thompon, R. (2009).** International Olympic Committee Medical Commission Working Group Women in Sport. Position Stand on the Female Athlete Triad, 2005. Available at http://multimedia.olympic.org/pdf/en_report_917.pdf. Accessed 4 August 2009.
33. **Torstveit, M.K. & Sundgot-Borgen, J. (2005b).** The female athlete triad exists in both elite athletes and controls. *Ned Sci Sports Exerc.* 37(9), 1449-1459.
34. **Rosendahl, J., Bormann, B., Aschenbrenner, K., Aschenbrenner, F., Strauss, B. (2009).** Dieting and disordered eating in German high school athletes and non-athletes. *Scand J Med Sci Sports.* 19(5), 731-739.
35. **Nattiv, A., Loucks, A.B., Manore, M.M., Sanborn, C.F., Sundgot-Borgen, J., Warren, M.P. (2007).** The female athlete triad. Special communications: position stand. *Med Sci Sports Exerc.* 39(10), 1867-1882.
36. **Holm-Denoma, J.M., Scaringi, V., Gordon, K.H., Van Orden, K.A., Joiner, T.E. Jr. (2009).** Eating disorder symptoms among undergraduate varsity athletes, club athletes, independent exercisers, and nonexercisers. *Int J Eat Disord.* 42(1), 47-53.
37. **Brunet, M. (2005).** Female athlete triad. *Clin Sports Med.* 24(3), 623-636.
38. **Warren, M.P. (1999).** Health issues for women athletes: exercise induced amenorrhea. *J Clin Endocrinol Metab.* 84(6): 1892-1996.
39. **Warren, M.P., Brooks-Gunn, J., Fox, R.P., Holderness, C.C., Hyle, E.P., Hamilton, W.G. (2002).** Osteopenia in exercise-associated amenorrhea using ballet dancers as a model: a longitudinal study. *J Clin Endocrinol Metab.* 87(7), 3162-3168.
40. **Zanker, C.L. & Swaine, I.L. (1998).** Bone turnover in amenorrhoeic and eumenorrhoeic women distance runners. *Scandinavian J Ned Sci Sport.* 8(1), 20-26.
41. **Loucks, A.B., Laughlin, G., Mortola, J.F., Girton, L., Nelson, C., Yen, S.S.C. (1992).** Hypothalamic-pituitary-tyroidal function in eumenorrhoeic and amenorrhoeic athletes. *J Clin Endocrinol Metab.* 75(2), 514-418.
42. **De Souza, M.J. & Williams, N.I. (2005).** Beyond hypoestrogenism in amenorrhoeic athletes: energy deficiency as a contributing factor to bone loss. *Curr Sports Med Rep.* 4(1), 38-44.
43. **Zanker, C.L. & Swaine, I.L. (2000).** Responses of bone turnover markers to repeated endurance running in humans under conditions of energy balance or energy restriction. *Eur J Appl Physiol.* 83, 434-440.
44. **Quah, Y.V., Poh, B.K., Ng, L.O., Noor, M.I. (2009).** The female athlete triad among elite Malaysian athletes: prevalence and associated factors. *Asia Pac J Clin Nutr.* 18(2), 200-208.
45. **Nelson, W.L., Hughes, H.M., Katz, B., Searight, H.R. (1999).** Anorexic eating attitudes and behaviors of male and female college students. *Adolescence.* 34(135), 621-633.

46. **Pope, H.G., Katz, D.L., Hudson, J.I. (1993).** Anorexia nervosa and “reverse anorexia” among 108 male bodybuilders. *Compr Psychiatry*. 34(6), 406-409.
47. **Pope, H.G. Jr., Gruber, A.J., Choi, P., Olivardia, R., Phillipps, K.A. (1997).** An underrecognized form of body dysmorphic disorder. *Psychosomatics*. 38(6), 548-557.
48. **Olivardia, R., Pope, H.G. Jr., Hudson, J.I. (2000).** Muscle dysmorphia in male weightlifters: A case-control study. *Am J Psychiatry*. 157(8), 1291-1296.
49. **Walberg, J.L. & Johnston, C.S. (1991).** Menstrual function and eating behavior in female recreational weight lifters and competitive body builders. *Med Sci Sports Exerc*. 23(1), 30-36.
50. **Anderson, R.E., Barlett, S.J., Morgan, G.D., Brownell, K.D. (1995).** Weight loss, psychological, and nutritional patterns in competitive male body builders. *Int J Eat Disord*. 18(1), 49-57.
51. **Sundgot-Borgen, J. (1993).** Prevalence of eating disorders in elite female athletes. *Int J Sport Nutr*. 3(1), 29-40.
52. **Sundgot-Borgen, J. (1993).** Nutrient intake of female elite athletes suffering from eating disorders. *Int J Sport Nutr*. 3(4), 431-442.
53. **Olivardia, R. (2001).** Mirror, mirror on the wall, who’s the largest of them all? The features and phenomenology of muscle dysmorphia. *Harv Rev Psychiatry*. 9(5), 254-259.
54. **Kanayama, G., Gruber, A.J., Pope, H.G. Jr., Borowiecki, J.J., Hudson, J.I. (2001).** Over-the-counter drug use in gymnasiums: An underrecognized substance abuse problem? *Psychother Psychosom*. 70(3), 137-140.
55. **Resch, M. (2007).** Eating disorders in sports—sports in eating disorders. *Orv Hetil*. 148(40), 1899-1902.
56. **Steen, S.N. (1996).** The competitive athlete: In: Rickert VI, editor. *Adolescent Nutrition: Assessment and Management*. New York, NY: Chapman and Hall, 223-247.
57. **Tofler, I.R., Stryer, B.K., Micheli, L.J., Herman, L.R. (1996).** Physical and emotional problems of elite female gymnasts. *N Engl J Med*. 335(4), 281-283.
58. **Abraham, S.F., Mira, M., Beumont, P.J., Sowerbutts, T.D., Llewellyn-Jones, D. (1983).** Eating behaviours among young women. *Med J Aust*. 2(5), 225-228.
59. **Pierce, E.F. & Daleng, M.L. (1998).** Distortion of body image among elite female dancers. *Percept Mot Skills*. 87(3), 769-770.
60. **Torstveit, M.K., Rosenvinge, J., Sundgott-Borgen, J. (2008).** Prevalence of eating disorders and the predictive power of risk factor models in female elite athletes: a controlled study. *Scand J Med Sci Sports*. 18(1), 108-118.
61. **Anderson, C. & Petrie, T.A. (2012).** Prevalence of disordered eating and pathogenic weight control behaviors among NCAA division I female collegiate gymnasts and swimmers. 83(1), 120-124.
62. **Byrne, S. & McLean, N. (2002).** Elite athletes: effects of the pressure to be thin. *J Sci Med Sport*. 5(2), 80-94.
63. **Black, D.R., Larkin, L.J., Coster, D.C., Leverenz, L.J., Abood, D.A. (2003).** Physiologic screening test for eating disorders/ disordered eating among female collegiate athletes. *J Athl Train*. 38(4), 286-297.
64. **Sundgot-Borgen, J. & Larsen, S. (1993).** Preoccupation with weight and menstrual function in female elite athletes. *Scand J Med Sci Sports*. 3, 156-163.
65. **Torstveit, M.K. & Sundgot-Borgen, J. (2005).** The female triad: are elite athletes at increased risk? *Med Sci sports Exerc*. 37(2), 184-193.
66. **Micklesfield, L.K., Lambert, E.V., Fataar, A.B., Noakes, T.D., Myburgh, K.H. (1995).** Low bone density in mature, premenopausal ultramarathon runners. *Med Sci Sports exerc*. 27(5), 688-696.
67. **Dancyger, L.F. & Garfinkel, P.E. (1995).** The relationship of partial syndrome eating disorders to anorexia nervosa and bulimia nervosa. *Psychol Med*. 25(5), 1019-1025.
68. **Johnson, C.L., Stuckey, M.K., Lewis, L.D., Schwartz, D.M. (1982).** Bulimia: a descriptive survey of 316 cases. *Int J Eat Disord*. 2(1), 3-16.
69. **Lowe, M.R., Gleaves, D.H., DiSimone-weiss, R.T., Furgueson, C., Gayda, C.A., Kolsky, P.A., Neal-Walden, T., Nelsen, L.A., McKinney, S. (1996).** Restraint, dieting, and the continuum model of bulimia nervosa. *J Abnorm Psychol*. 105(4), 508-517.

70. **Shisslak, C.M., Crago, M., Estes, L.S. (1995).** The spectrum of eating disturbances. *Int J Eat Disord.* 18(3), 209-219.
71. **Byrne, S. & Mc Lean, N. (2001).** eating disordered in athletes: a review of the literature. *J Sci Med Sport.* 4(2), 145-159.
72. **Striegel-Moore, R.H. & Bulik, C.M. (2007).** Risk factors for eating disorders. *American Psychologist.* 62(3), 181-198.
73. **Walsh, J.M., Wheat, M.E., Freund, K. (2000).** Detection, evaluation, and treatment of eating disorders. *J Gen Intern Med.* 15(8), 577-590.
74. **Martinsen, M. & Sundgot-Borgen, J. (2013).** Higher prevalence of eating disorders among adolescent elite athletes than controls. *Med Sci sports Exerc.* 45(6), 1188-1197.
75. **Brown, S. & Bonifazi, D.Z. (1993).** An overview of anorexia and bulimia nervosa, and the impact of eating disorders on the oral cavity. *Compendium Cont Educ Dent.* 14(12), 1594, 1596-1602, 1604-1608.
76. **Schmidt, U. & Treasure, J. (1997).** Eating disorders and the dental practitioner. *Eur J Prosthodont Restor Dent.* 5(4), 161-167.
77. **Greenleaf, C., Petrie, T.A., Carter, J., Reel, J. (2009).** Female collegiate athletes: Prevalence of eating disorders and disordered eating behaviors. *J Am Coll Health.* 57(5), 489-495.
78. **Sanford-Martens, T.C., Davidson, M.M., Yakushko, O.F., Martens, M.P., Hinton, P., Beck, N. (2005).** Clinical and subclinical eating disorders: An examination of collegiate athletes. *J Appl Sport Psychol.* 17, 79-86.
79. **Kerr, G., Berman, E., Souza, M. (2006).** Disordered eating in women's gymnastics: Perspectives of athletes, coaches, parents, and judges. *J Appl Sport Psychol.* 18, 28-43.
80. **Carter, J.E. & Rudd, N.A. (2005).** Disordered eating assessment for college student-athletes. *Women in sport and Physical Activity Journal.* 14, 62-75.
81. **Petrie, T.A., Greenleaf, C., Reel, J.J., Carter, J. (2009).** An examination of psychosocial correlates of disordered eating among female collegiate athletes. *Res Q Exerc Sport.* 80(3), 621-632.
82. **Petrie, T.A. & Greenleaf, C. (2007).** Eating disorders in sport: from theory to research to intervention. In G. Tenenbaum & R. Eklund (Eds.), *Handbook of sport psychology* (3rd ed.). Hoboken, NJ.: John Wiley & Sons, Inc, 352-378.
83. **Wilmore, J.H. (1991).** Eating and weight disorders in the female athlete. *Int J Sport Nutr.* 1(2), 104-117.
84. **Beals, K.A. & Manore, M.M. (1994).** The prevalence and consequences of subclinical eating disorders in female athletes. *Int J Sport Nutr.* 4(2), 175-195.
85. **Brownell, K.D. & Rodin, J. (1992).** Prevalence of eating disorders in athletes. In: Brownell KD, Rodin J, Wilmore JH, eds. *Eating, Body, Weight, and Performance in Athletes. Disorders of Modern Society.* Philadelphia, PA: Lea & Febriger, 128-143.
86. **Guthrie, S.R. (1991).** Prevalence of eating disorders among intercollegiate athletes: contributing factors and preventive measures. In: Black D.R., ed. *Eating disorders among athletes: theory, issues, and research.* Reston, VA: Association for Girls and Women in Sport, Associations for Health, Physical Education, Recreation, and Dance. 43-66.
87. **Johnson, C., Powers, P.S., Dick, R. (1999).** Athletes and eating disorders: the National Collegiate Athletic Association Study. *Int J Eat Disord.* 26(2), 179-188.
88. **Reinking, M.F. & Alexander, L.E. (2005).** Prevalence of disordered-eating behaviours in undergraduate female collegiate athletes and nonathletes. *J Athl Train.* 40(1), 47-51.
89. **Thiel, A., Gottfried, H., Hesse, F.W. (1993).** Subclinical eating disorders in male athletes : a study of the low weight category in rowers and wrestlers. *Acta Psychiatr Scand.* 88(4), 259-265.
90. **Warren, B.J., Stanton, A.L., Blessing, D.L. (1990).** Disordered eating patterns in competitive female athletes. *Int J Eat Disord.* 9(4), 565-569.
91. **Stephenson, J.D. (1991).** Medical consequences and complications of anorexia and bulimia nervosa in female athletes. *Athl Train J Natl Athl Train Assoc.* 26(2), 130-135.
92. **Diagnostic and Statistical Manual of Mental Disorders (2000).** Washington, DC: American Psychiatric Association. *Eating Disorders*, 4th ed., 583-595.
93. **Snead, D.B., Stubbs, C.C., Weltman, J.Y., Evans, W.S., Veldhuis, J.D., Rogol, A.D., Teates, C.D., Weltman, A. (1992).** Dietary patterns, eating behaviors, and bone mineral density in women runners. *Am J Clin Nutr.* 56(4), 705-711.

94. **Ravaldi, C., Vannacci, A., Zucchi, T., Mannucci, E., Cabras, P.L., Boldrini, M., Murciano, L., Rotella, C.M., Ricca, V. (2003).** Eating disorders and body image disturbances among ballet dancers, gymnasium users and body builders. *Psychopathology*. 36(5), 247-254.
95. **Burkhardt, N., Roberts, M., Alexander, M., Dodds, A. (2005).** Communicating effectively with patients suspected of having bulimia nervosa. *J Am Dent assoc*. 136(8), 1130-1137.
96. **Abrams, R.A. & Ruff, J.C. (1986).** Oral signs and symptoms in the diagnosis of bulimia. *J Am Dent Assoc*. 113(5), 761-764.
97. **Pindborg, J.J. (1970).** Pathology of Dental Hard Tissues. Copenhagen: Munksgaard, 312-321.
98. **Johansson, A.K., Omar, R., Carlsson, G.E., Johansson, A. (2012).** Dental erosion and its growing importance in clinical practice: from past to present. *Int J Dent*. Article ID 632907.
99. **Barron, R.P., Carmichael, R.P., Marcon, M.A., Sàndor, G.K.B. (2003).** Dental erosion in gastroesophageal reflux disease. *J Can Dent Assoc*. 69(2), 84-89.
100. **Schlueter, N, Jaeggi, T., Lussi, A. (2012).** Is dental erosion really a problem?. *Adv Dent Res*. 24(2), 68-71.
101. **Harris, N.O. & Segura, A. (2004).** The developing carious lesion. In: Harris, N.O. & Garcia-Godoy, F., eds. Primary preventive dentistry. Pearson Prentis Hall. 6, 45-72.
102. **Ehlen, L.A., Marshall, T.A., Qian, F., Wefel, J.S., Warren, J.J. (2008).** Acidic beverages increase the risk of in vitro tooth erosion. *Nutr Res*. 28(5), 299-303.
103. **Hamasha, A.A., Zawaideh, F.I., Al-Hadithy, R.T. (2014).** Risk indicators associated with dental erosion among Jordanian school children aged 12-14 years of age. *Int J Paediatr Dent*. 24(1), 56-68.
104. **Eccles, J.D. & Jenkins, W.G. (1974).** Dental Erosion and Diet. *J Dent*. 2(4), 153-159.
105. **Centerwall, B.S., Armstrong, C.W., Funkhouser, L., Elzay, R. (1986).** Erosion of dental enamel among competitive swimmers at a gas-chlorinated swimming pool. *Am J Epidemiol*. 123(4), 641-647.
106. **Scheutzel, P. (1996).** Etiology of dental erosion--intrinsic factors. *Eur J Oral Sci*. 104(2), 178-190.
107. **Dawsen, J & Jones, C. (1977).** Vomiting induced hypokalaemic alkalosis and parotid swelling. *Practitioner*. 218(1304), 267-268.
108. **Levin, P.A., Falko, J.M., Dixon, K., Gallup, E.M., Saunders, B. (1980).** Benign parotid enlargement in bulimia. *Ann Intern Med*. 93(6), 827-829.
109. **Walsh, B.T., Croft, C.B., Katz, J.L. (1981).** Anorexia nervosa and salivary gland enlargement. *Int J Psychiatry Med*. 11(3), 255-261.
110. **Stafne, E.C. & Lovstedt, S.A. (1947).** Dissolution of tooth surface by lemon juice, acid beverages and acid from other sources. *J Am Dent Assoc*. 34(9), 586-592.
111. **Kleier, D.J., Aragon, S.B., Averbach, R.E. (1984).** Dental management of the chronic vomiting patient. *J Am Dent Assoc*. 108(4), 618-621.
112. **Brady, W.F. (1980).** The anorexia nervosa syndrome. *Oral Surg Oral Med Oral Pathol*. 50(6), 509-516.
113. **Larsen, M.J. & Nyvad, B. (1999).** Enamel erosion by some soft drinks and orange juices relative to their pH, buffering effect and contents of calcium phosphate. *Caries Res*. 36(1), 81-87.
114. **Rees, J., Loyn, T., McAndrew, R. (2005).** The acidic and erosive potential of five sports drinks. *Eur J Prosthodont Restor Dent*. 13(4), 186-190.
115. **Cochrane, N.J., Yuan, Y., Walker, G.D., Shen, P., Chang, C.H., Reynolds, C., Reynolds, E.C. (2012).** Erosive potential of sports beverages. *Aust Dent J*. 57(3), 359-364.
116. **Okida, R.C., dos Santos, D.M., Vechiato Filho, A.J., Andreotti, A.M., de Medeiros, R.A., Goiato, M.C. (2014).** Prosthetic rehabilitation of a patient with gastroesophageal reflux disease: 4-year followup. *Hindawi Publishing Corporation Case Reports in Dentistry*. Vol. 2014, Article ID 270365.
117. **Frese, C., Frese, F., Kuhlmann, S., Saure, D., Reljic, D., Staehle, H.J., Wolff, D. (2014).** Effect of endurance training on dental erosion, caries, and saliva. *Scand J Med Sci Sports*. Epub ahead of print.

118. **Rios, D., Magalhães, A.C., Honórico, H.M., Buzalaf, M.A., Lauris, J.R., Machado, M.A., Silva, S.M.B. (2007).** The prevalence of deciduous tooth wear in six-year-old children and its relationship with potential explanatory factors. *Oral Health Prev Dent.* 5(3), 167-171.
119. **Rios, D., Honórico, H.M., Magalhães, A.C., Buzalaf, M.A., Palma-Dibb, R.G., Machado, M.A.A.M., Silva, S.M.B. (2006).** The influence of toothbrushing on enamel softening and abrasive wear of eroded bovine enamel: an in situ study. *Braz Oral Res.* 20(2), 148-154.
120. **Bryant, S., McLaughlin, K., Morgaine, K., Drummond, B. (2011).** Elite athletes and oral health. *Int J Sports Med.* 32(9), 720-724.
121. **Milosevic, A., Kelly, M.J., McLean, A.N. (1997).** Sports supplement drinks and dental health in competitive swimmers and cyclists. *Br Dent J.* 182(8), 303-308.
122. **Needleman, I, Ashley, P., Petrie, A., Fortune, F., Turner, W., Jones, J., Niggli, J., Engebretsen, L., Budgett, R., Donos, N., Clough, T., Porter, S. (2013).** Oral health and impact on performance of athletes participating in the London 2012 Olympic Games: a cross-sectional study. *Br J Sports Med.* 47(16), 1054-1054.
123. **Järvinen, V.K., Rytömaa, I.I., Heinonen, O.P. (1991).** Risk factors in dental erosion. *J Dent Res.* 70(6), 942-947.
124. **McClure, F.J. & Ruzicka, S.J. (1946).** The destructive effect of citrate vs. lactate Ions on rat's Molar tooth surface, in vivo. *J Dent Res,* 25(1), 1-12.
125. **Elsbury, W.B. (1952).** Hydrogen-ion concentration and acid erosion of the teeth. *Br Dent J.* 93, 177-179.
126. **Thomas, A.E. (1957).** Further observations on the influence of citrus fruit juices on human teeth. *NY State Dent J.* 23, 424-430.
127. **Touyz, L.Z.C. & Glassman, K.M. (1981).** Citrus, acid and teeth. *Tydskr Tandheelkd Ver S Afr.* 36(3), 195-201.
128. **High, A.S. (1977).** An unusual pattern of dental erosion. A case report. *Br Dent J.* 143(12), 403-404.
129. **Mueninghoff, L.A. & Johnson, M.H. (1982).** Erosion: a case caused by unusual diet. *J Am Dent Assoc.* 104(1), 51-52.
130. **Rytömaa, I., Meurman, J.H., Koskinen, J., Laakso, T., Gharazi, L., Turunen, R. (1988).** In vitro erosion of bovine enamel caused by acidic drinks and other foodstuffs. *Scand J Dent Res.* 96(4), 324-333.
131. **Sorvari, R. & Kiviranta, I. (1988).** A semiquantitative method of recording experimental tooth erosion and estimating occlusal wear in the rat. *Arch Oral Biol.* 33(4), 217-220.
132. **Sorvari, R. (1989).** Effects of various sport drink modifications on dental caries and erosion in rats with controlled eating and drinking pattern. *Proc Finn Dent Soc.* 85(1), 13-20.
133. **Linkosalo, E., Markkanen, S., Alakuijala, A., Seppä, L. (1988).** Effects of some commercial health beverages, effervescent vitamin C preparations and berries on human dental enamel. *Proc Finn Dent Soc.* 84(1), 31-38.
134. **Wöltgens, J.M.H., Vingerling, P., De Blicke-Hoger-Vorst, J.M.A., Bervoets, D.J. (1985).** Enamel erosion and saliva. *Clin Prev Dent.* 7(3), 8-10.
135. **Meurman, J., Rytömaa, I., Kari, K., Laakso, T., Murtomaa, H. (1987).** Salivary pH and glucose after consuming various beverages, including sugar-containing drinks. *Caries Res.* 21(4), 353-359.
136. **Tenovu, J. & Rekola, M. (1968).** Dental erosion in industry. *Br J Ind Med.* 25, 249-266.
137. **Savad, E.N. (1982).** Enamel erosion... multiple cases with a common cause (?). *J N J Dent Assoc.* 53(1), 32, 35-37, 60.
138. **Geurtsen, W. (2000).** Rapid general dental erosion by gas-chlorinated swimming pool water. Review of the literature and case report. *Am J Dent.* 13 (6), 291-293.
139. **Swimming pool operators manual.** Nebraska Department of Health and Human Services, Lincoln Lancaster County Health Department, Douglas County Health Department, Central District Health Department; 2007. www.hhs.state.ne.us/puh/enh/San/swimming/Swimming-Pool-Operators-Manual.pdf.(accessed 2008).
140. **Dawes, C. (2003).** What is the critical pH and why does a tooth dissolve in acid? *J Can Dent Assoc.* 69(11), 722-724.
141. **Kaczmarek, W. (2010).** The status of mineralized dental tissues in young competitive swimmers. *Ann Acad Med Stetin.* 56(3), 81-86.
141. **Baghele, O.N., Majumdar, I.A., Thorat, M.S., Nawar, R., Baghele, M.O., Makkad, S. (2013).** *Compend Contin Educ Dent.* 34(2), 20-24.

142. **Tylenda, C.A., Roberts, M.W., Elin, R.J., Li, S.H., Altemus, M. (1991).** Bulimia nervosa: its effects on salivary chemistry. *J Am Dent Assoc.* 122(6), 37-41.
143. **Mandel, L. & Kaynar, A. (1992).** Bulimia and parotid swelling: a review and case report. *J Oral Maxillofac Surg.* 50(10), 1122-1125.
144. **Stege, P., Visco-Dangler, L., Rye, L. (1982).** Anorexia nervosa: review including oral and dental manifestations. *J Am Dent Assoc.* 104(5), 648-652.
145. **Sanchez, G.A. & Fernandez De Preliasco, M.V. (2003).** Salivary pH changes during soft drink consumption in children. *Int J Paediatr Dent.* 13(4), 251-257.
146. **Ruff, J.D., Koch, M.O., Perkins, S. (1992).** Bulimia: dentomedical complications. *Gen Dent.* 40(1), 22-24.
147. **Roberts, M.W. & Li, S. (1987).** Oral findings in anorexia nervosa and bulimia nervosa: a study of 47 cases. *J Am Dent assoc.* 115(3), 407-410.
148. **Foster, M. & Readman, P. (2009).** Sports dentistry--what's it all about? *Dent Update.* 36(3), 135-138, 141-144.
149. **Forrest, J.O. (1969).** Dental condition of Olympic Games contestants --a pilot study. *Dent Pract Dent Rec.* 20(3), 95-101.
150. **Coombes, J.S. (2005).** Sports drinks and dental erosion. *Am J Dent.* 18(2), 101-104.
151. **Noble, W.H., Donovan, T.E., Geissberger, M. (2011).** sports drinks and dental erosion. *J Can Dent Assoc.* 39(4), 233-238.
152. **Sirimaharaj, V., Brearley Messer, L., Morgan, M.V. (2002).** Acidic diet and dental erosion among athletes. *Aust Dent J.* 47(3), 228-236.
153. **Mulic, A., Tveit, A, Songe, D. et al. xxx (2012).** Dental erosive wear and salivary flow rate in physically active young adults. *BMC Oral Health.* 12, 8.
154. **Gleeson, M. (2007).** Immune function in sport and exercise. *J Appl Physiol.* 103(2), 693-699.
155. **Ashley, P., Di Iorio, A., Cole, E., Tanday, A., Needleman, I. (2015).** Oral health of elite athletes and association with performance: a systematic review. *Br J Sports Med.* 49(1), 14-19.
156. **Cowan, R.D., Sabates, C.R., Gross, K.B.W., Elledge, D.A. (1991).** Integrating dental and medical care for the chronic bulimia nervosa patient: a case report. *Quintessence Int.* 22(7), 553-557.
157. **Broliato, G.A., Volcato, D.B., Reston, E.G., Kramer, P.F., Marquezan, M., Ruzzarin, F., Spiguel, M.H. (2008).** Esthetic and functional dental rehabilitation in a patient with gastroesophageal reflux. *Quintessence International,* 39(2), 131-137.
158. **Lussi, A., Jaeggi, T, Zero, D. (2004).** The role of diet in the aetiology of dental erosion. *Caries Res.* 38(1), 34-44.
159. **Davis, R.E, Marshall, T.A., Qian, F, Warren, J.J. (2007).** In vitro protection against dental erosion afforded by commercially available, calcium-fortified 100 percent juices. *J Am Dent Assoc.* 138(12), 1593-1598.
160. **Hulley, S.B., Cummings, S.R., Browner, W.S., Grady, D., Hearst, N., Newman, T.B. (2001).** *Designing Clinical Research.* 2. Philadelphia: Lippincott Williams & Wilkins.
161. **Chadwick, B.L., White, D.A., Morris, A.J., Evans, D. Pitts, N.B. (2006).** Non-cariious tooth conditions in children in the UK, 2003. *Br Dent J.* 200(7), 379-384.
162. **Imfeld, C. & Imfeld, T. (2005).** Eating disorders (II)—dental aspects. *Schweiz Monatsschr Zahnmed.* 115(12), 1163-1671.

Address for correspondence

Authors : *Dr. med. Dent . Antina Schulze - General Outpatient Ambulance and Sports Dentistry of the Institute of Sports Medicine, University of Leipzig, Germany*

E-mail : a.schulze@uni-leipzig.de

EFFECTS OF A 9 MONTHS EXERCISE TRAINING ON INFLAMMATORY AND LIPID MARKERS IN TYPE 2 DIABETIC PATIENTS

Antina Schulze DDS & Martin Busse MD, PHD

General Outpatient Ambulance and Sports Dentistry of the Institute of Sports Medicine, University of Leipzig, Germany

Abstract

Aims: Desired effects of a rehabilitative training are: Decreases in inflammation and lipid risk factors, in HbA_{1c}, and increases in cardiopulmonary capacity. Though the beneficial effects of intense training are well established, no epidemiologic relevance of such training regimens has been found. Apparently a moderate and stress free program is an important prerequisite for lasting acceptance and life style change. Therefore studies should point to low but still effective training intensity. **Methods:** 33 type 2 diabetes patients (63.8 ± 6.9 years) with insulin regimen had a 9 months rehabilitative exercise training two times/week. Plasma levels of inflammatory and lipid markers, specific diabetic and training parameters were measured at baseline, after three, six and nine months.

Results: Rehabilitative training resulted in a significant increase in tumor necrosis factor-alpha (12.27 ± 7.93 vs. 15.12 ± 9.58 or 14.89 ± 9.25 pgxl^{-1} after 6 or 9 months). Interleukin-6 was reduced significantly after 3 months (4.3 ± 7.02 vs. 3.92 ± 6.68 pgxl^{-1}) whereas C-reactive protein remained unchanged. Lipid parameters decreased markedly after 9 months (triglycerides 2.10 ± 1.2 vs. 1.82 ± 1.07 mmolxl^{-1} ; cholesterol 5.18 ± 1.12 vs. 4.92 ± 0.91 mmolxl^{-1} ; LDL 3.24 ± 0.85 vs. 2.88 ± 0.66 mmolxl^{-1}). HDL and HbA_{1c} remained almost unchanged. Weight decreased moderately but significantly (99.21 ± 17.62 vs. 97.73 ± 16.61 kg) also BMI (35.28 ± 5.3 vs. 34.78 ± 5.34). Endurance capacity was increased by 103%, rate-pressure product at rest and blood pressure markedly decreased.

Conclusions: 9 months of rehabilitative exercise training in type 2 diabetes patients had moderate but significant effects on lipid factors, no relevant effect on C-reactive protein and Interleukin-6 but resulted in a marked increase in tumor necrosis factor-alpha. A marked improvement in endurance capacity, cardiac stress and blood pressure was seen.

Key words: Exercise, diabetes mellitus, immune markers, risk factors, physical endurance

Abbreviations: BG= blood glucose, EC= endurance capacity, RPP= rate-pressure product

1. INTRODUCTION

It is recognized that the path from physical inactivity and obesity to lifestyle-related diseases involves low-grade inflammation, indicated by elevated plasma levels of inflammatory markers. Systemic and local inflammation is hypothesized to play a significant role in the pathogenesis and progression of insulin resistance, impaired glucose tolerance and even diabetes resulting from chronic activation of the innate immune system. In obesity, the white adipose tissue is characterized by an increased production and secretion of inflammatory molecules including TNF- α and interleukin-6 (IL-6), which have local and also systemic effects on other organs. Recent data indicate that white adipose tissue is infiltrated by macrophages, which may be a major source of locally-produced pro-inflammatory cytokines such as TNF- α and IL-6 [1]. Increased macrophage infiltration of adipose tissue has been described in obese individuals, as well as an increase in "classically activated" macrophages [2].

Obesity and type 2 diabetes mellitus are associated with many metabolic disorders including dyslipidemia, hypertension and arteriosclerosis [3].

C-reactive protein (CRP) levels are directly related to increased risk of coronary disease and diabetes and have been associated with both high body mass index (BMI) and low physical activity in cross sectional studies [4, 5, 6,7,8]. CRP is produced by the liver in response to an acute infection or inflammation. Elevated concentrations of CRP have been associated with coronary heart disease, obesity, diabetes, smoking, and sedentary lifestyle [9]. CRP levels, inversely related to cardiorespiratory fitness, are associated with an increased risk of cardiovascular disease. Numerous studies have observed an inverse association between CRP and regular physical activity and/ or exercise [4, 5, 6, 7, 8, 10]. In contrast few studies have prospectively examined the effect of exercise training alone on resting levels of CRP, particularly in individuals with elevated levels of CRP [11, 12].

Controversy about the role of TNF-alpha in insulin resistance has been raised by inconsistent results in human studies. Some find no association [12, 14] whereas others do [15, 16]. Other results suggest that exercise may induce increased levels of anti-inflammatory cytokines (e.g. IL-10, IL-6), and cytokine inhibitors (e.g. IL-1 receptor antagonist, TNF- α receptor) [17, 18].

Since diabetes is a chronic low-grade systemic inflammation, we suggest that exercise may have anti-inflammatory effects and improves the overall immune status of type 2 diabetic patients with insulin regimen.

2. METHODS

Study population and clinical data: 33 well-controlled type 2 diabetic subjects (17 females, 16 males, 63.8 ± 6.9 years, weight 99.21 ± 17.62 kg, height 167.6 ± 9.6 cm, BMI 35.28 ± 5.3) with insulin regimen participated in a 9 months combined endurance/resistance exercise training program. Control of diabetes was measured by the percentage of glycated hemoglobin in the blood (mean: $6.4 \pm 0.76\%$ (46.45 mmol/mol)). At baseline, after three, six and nine months, fasting blood samples for measurement of inflammatory and lipid markers were taken. 88 % of the Patients had an antihypertensive medication, 24 % were taking aspirin and 48 % drugs for lipid disorders. No health and nutrition intervention was conducted. There were no relevant changes in medication throughout the study period. No regular physical exercise was performed by any of the patients before the study, most of them were unemployed. Exclusion criteria were: acute/chronic infections, antibiotic therapy, rheumatoid diseases.

Laboratory measurements: Fasting blood samples were collected at baseline, after three, six and nine months. Laboratory analyses were performed at 8 h after a 12 h overnight fast. Concentrations of IL-6, TNF-alpha, and C-reactive protein were measured as well as the lipid profiles (triglycerides, cholesterol, high- and low-density lipoproteins (HDL, LDL)), leukocytes, thrombocytes, and the creatine kinase levels.

Training protocol: The patients exercised two times per week (A- and B- session). All A-Sessions commenced and concluded with a warming-up and cooling-down period. Session A consisted of 45 minutes endurance training (cycle-ergometer, tread mill, rowing-ergometer) and 15min of pulley exercises. Session B consisted of 45 minutes of supervised moderate swimming. The program started out with low intensity training for each form of exercise and was weekly increased according to the individuals' increasing endurance capacity. Before and after each exercise set heart rate, blood pressure, blood glucose, and work load were measured and recorded. Data at baseline and after 9 months of training were analysed. The cardiac load was estimated using the rate-pressure product, divided by 1000.

Statistical analyses: All data are presented as means \pm SD. Pairwise comparisons were carried out using the Wilcoxon matched pairs signed rank test. A p-value <0.05 was considered to indicate significance, $p < 0.01$ was accepted as very significant and $p < 0.005$ as extremely significant.

3. RESULTS

Body composition and metabolic data

	baseline	3 months	6 months	9 months	p-value (baseline vs. 3 months)	p-value (baseline vs. 6 months)	p-value (baseline vs. 9 months)
weight (kg)	99.21 \pm 17.62	97.73 \pm 16.39	97.59 \pm 16.61	97.73 \pm 16.61	<0.001	<0.006	<0.006
BMI	35.28 \pm 5.3	34.79 \pm 5.18	34.74 \pm 5.23	34.78 \pm 5.34	<0.0008	<0.004	<0.005
HbA_{1c} (%)	6.40 \pm 0.76	6.30 \pm 0.73	6.41 \pm 0.78	6.51 \pm 0.73	n.s.	n.s.	n.s.
IFCC (mmol/mol)	46.45	45.36	46.56	47.65	n.s.	n.s.	n.s.

Table 1. Weight, BMI, HbA_{1c}, IFCC and the significances between baseline vs. 3, 6, and 9 months of program participation.

Program effects:

There was a minor but significant and lasting decrease of body weight and BMI already after 3 months, but no relevant effect on HbA_{1c} and IFCC (Tab. 1).

Inflammatory markers

inflammatory markers	baseline	3 months	6 months	9 months	p-value (baseline vs. 3 months)	p-value (baseline vs. 6 months)	p-value (baseline vs. 9 months)
s-CRP(mgxl ⁻¹)	4.14±3.40	4.24±4.08	3.79±2.94	4.24±4.35	n.s.	n.s.	n.s.
IL-6 (pgxl ⁻¹)	4.30±7.02	3.92±6.68	3.95±6.53	3.98±6.74	<0.03	n.s.	n.s.
TNF-α (pgxl ⁻¹)	12.27±7.93	12.79±9.65	15.12±9.58	14.89±9.25	n.s.	<0.002	<0.001
thrombocytes (exp9xl ⁻¹)	242.84±62.60	235.03±60.32	245.7±59.96	237.88±63.71	n.s.	n.s.	<0,04
leucocytes (exp9xl ⁻¹)	6.75±1.53	6.75±1.50	6.82±1.37	6.77±1.43	n.s.	n.s.	n.s.
creatine kinase (IFCC, ukatxl ⁻¹)	2.76±2.12	2.65±2.12	2.35±1.47	2.32±1.31	n.s.	<0.03	<0.09

Table 2. s-CRP, IL-6, TNF-α, thrombocytes, leucocytes, and creatine kinase levels and the significances between baseline vs. 3, 6, and 9 months of program participation.

Baseline levels of CRP were below 5 mgxl⁻¹ but markedly above 1 mgxl⁻¹. There was only a minor significant decrease of IL-6 after 3 months. The most striking result is a marked increase in TNF-α which was significant after 6 and 9 months. A significant decrease in thrombocytes and creatine kinase were measured after 9 and 6 months respectively. There was no relevant change in leucocytes (Tab. 2).

Lipid parameters

lipid parameters (mmolxl ⁻¹)	baseline	3 months	6 months	9 months	p-value (baseline vs. 3 months)	p-value (baseline vs. 6 months)	p-value (baseline vs. 9 months)
Triglycerides	2.10±1.20	1.89±1.25	1.96±1.18	1.82±1.07	n.s.	n.s.	<0.03
Cholesterol	5.18±1.12	4.93±1.16	5.12±1.17	4.92±0.91	n.s.	n.s.	<0.03
HDL	1.22±0.34	1.22±0.33	1.25±0.41	1.24±0.38	n.s.	n.s.	n.s.
LDL	3.24±0.85	2.99±0.75	3.11±0.83	2.88±0.66	n.s.	n.s.	<0.003

Table 3. Triglycerides, cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL) values and the significances between baseline vs. 3, 6, and 9 months of program participation.

Blood lipid risk parameters were all markedly decreased after 9 months, but there was no relevant change in HDL values (Tab. 3).

Cardio-circulatory parameters for resting conditions

	baseline	3 months	6 months	9 months	p-value (baseline vs. 3 months)	p-value (baseline vs. 6 months)	p-value (baseline vs. 9 months)
HR (beats x min ⁻¹)	77.61±12.26	74.09±12.29	75.97±12.48	73.03±8.53	<0.05	n.s.	<0.002

RR_{sys}	142.42±19.18	138.76±18.75	134.06±15.94	135.64±17.01	n.s.	<0.02	<0.04
RR_{dia} (mmHg)	81.64±11.18	83.30±11.46	78.09±11.21	76.73±9.78	n.s.	n.s.	<0.04
RPP (HRxRR _{sys} x1000 ⁻¹)	11.03±2.11	10.28±2.28	10.17±1.93	9.98±1.78	<0.03	<0.03	<0.002

Table 4. HR= pre-exercise heart rate at rest, RR_{sys} and RR_{dia} = pre-exercise blood pressure systolic and diastolic at rest, and RPP= rate-pressure product before and after 3, 6, and 9 months of exercise training and the significances.

As a result of 6 and 9 months program participation blood pressure at rest was clinically significantly decreased. Since resting heart rate was also lower there was a marked effect on the resting rate-pressure product (Tab. 4).

Training effects on blood glucose before and after exercise

	baseline	3 months	6 months	9 months	p-value (baseline vs. 3 months)	p-value (baseline vs. 6 months)	p-value (baseline vs. 9 months)
BG pre (mmolx ⁻¹)	8.68±2.39	7.28±1.29	8.11±1.41	8.25±2.06	<0.006	n.s.	n.s.
BG post (mmolx ⁻¹)	6.17±1.67	5.21±1.03	5.63±1.60	5.65±1.50	<0.01	n.s.	n.s.
p value	<0.0001	<0.0001	<0.0001	<0.0001	n.s.	n.s.	n.s.

Table 5. Blood glucose (BG pre (-exercise), BG post (-exercise) (mmolx⁻¹)) before and after exercise at baseline and after 3, 6, and 9 months of program participation. The significances between blood glucose levels before and after training sessions were given, and also the significances between baseline and after 3, 6 and 9 months.

There was an effect of the program on resting blood glucose and on the after training blood glucose after 3 months. In tendency these effects persisted after 6 and 9 months. Exercise always induced a marked decrease in blood glucose (Tab. 5).

Cardio-circulatory values immediately taken after cycle-ergometry

	baseline	3 months	6 months	9 months	p-value (baseline vs. 3 months)	p-value (baseline vs. 3 months)	p-value (baseline vs. 3 months)
EC (watt)	27.61±3.23	45.03±14.76	51.89±17.04	56.14±19.60	<0.0001	<0.0001	<0.0001
Increase (%)					63	88	103
HR (beatsx ⁻¹ min ⁻¹)	97.97±13.06	94.06±12.38	101.36±13.63	100.52±10.60	<0.02	n.s.	n.s.
RR_{sys}	145.30±14.41	139.12±14.95	141.36±18.30	137.46±17.63	<0.02	n.s.	<0.01
RR_{dia} (mmHg)	74.88±6.67	70.58±7.14	68.42±7.07	67.21±6.48	<0.003	<0.0003	<0.0001
RPP (HRxRR _{sys} /1000)	14.31±2.63	13.11±2.4	14.42±3.09	13.89±2.79	<0.007	n.s.	n.s.

Table 6. EC= endurance capacity and increase of endurance capacity, HR= heart rate, RR_{sys} and RR_{dia}= post-exercise blood pressure systolic and diastolic, and RPP= rate-pressure product for exercise conditions before and after 3, 6, and 9 months of exercise. Please note that the rate-pressure product was similar although endurance capacity was increased at the different training time periods. It should also be noted that all values (except EC) do not refer to similar exercise values, but to the increased EC values.

As the most relevant exercise effect the rate-pressure product was decreased whereas training intensity was increased by 63 to 103 % of the initial values. In spite of increased exercise intensity also the diastolic pressure was very markedly and significantly decreased. The mean frequency of endurance/resistance training sessions in 9 months was 40.49 ± 9.69 or 13 times in a 3months period (Tab. 6).

4. DISCUSSION

There are 3 major groups of effects to be discussed.

- Effects on inflammatory markers and cellular parameters
- Effects on lipid profile and blood glucose
- Effects on cardio-circulatory system and endurance capacity

Effects on immune parameters and inflammatory markers

TNF-α: most striking result of this study is a lasting significant increase of *TNF-α*.

Increased *TNF-α* following short or chronic training periods has been reported only twice (Table 7). In general there were no relevant changes or at times a decrease of *TNF-α* (Table 7). No such results in type 2 diabetes patients with insulin therapy have come to our knowledge.

Epidemiological studies and clinical interventions have reported contradictory findings related to dietary or exercise interventions and the resulting alterations in plasma cytokines [19]. Carey et al. [20] recently reported a lack of association between skeletal muscle *TNF-α* mRNA and circulating levels of *TNF-α* with whole-body insulin sensitivity in a wide variety of subjects including individuals with type 2 diabetes. Therefore, the role of *TNF-α* in the development of insulin resistance in humans is unclear and requires further research.

Various reported exercise and training effects on TNF-alpha, C-reactive protein, and Interleukin-6

author(s), year	type of exercise training	study population	TNF-α	CRP	IL-6
Loria-Kohen et al. (2013) [21]	22 weeks exercise training and caloric restriction (strength, endurance, combined)	84 obese	↓	↓	↓
Nikseresht et al. (2014) [22]	3 months nonlinear resistance + aerobic interval training	12 and 10 men middle aged and obese	n.s.	n.s.	n.s.
Donges et al. (2013) [23]	3 months exercise training (resistance/endurance)	47 untrained middle aged men	↓	n.s.	↓
Kim et al. (2013) [24]	6 weeks exercise training	22 cardiac rehabilitation patients	n.s.	n.s.	n.s.
Libardi et al. (2012) [25]	4 months exercise training (resistance, endurance, concurrent)	34 sedentary middle-age men	n.s.	n.s.	n.s.
Reed et al. (2010) [26]	4 months exercise training and caloric restriction (aerobic training)	Premenopausal women	n.s.	n.s.	↓
Andersson et al. (2010) [27]	14 days cross-country skiing tour endurance (12-30km/day)	20 men	↑ ↑	↑ ↑	n.s.

Beavers et al. (2010) [28]	12 months moderate intensity training	200 elderly	n.s.	---	---
Balducci et al. (2009) [29]	12 months high intensity (aerobic, aerobic/resistance) training	20 with type 2 diabetes	↓	↓	---
Castellano et al. (2008) [30]	8 week cycle-ergometry	11 with multiple sclerosis	↑ ↑	---	↓
Lambert et al. (2008) [31]	12 week training (aerobic + resistance training)	8 obese elderly	↓	---	↓
Kadoglou et al. (2007) [32]	6 months aerobic training	60 overweight with type 2 diabetes	n.s.	↓	---
Aronson et al. (2004) [33]	Physical fitness evaluation	1.640 with metabolic syndrome	---	↓	---
Goldhammer et al. (2005) [34]	12 week aerobic exercise	28 with coronary disease	---	↓	↓
Lakka et al. (2005) [12]	20 week exercise training 3x/week	162 sedentary healthy with high initial CRP-baseline levels 490 with low or moderate initial CRP baseline levels	---	↓	---
			---	n.s.	---
Milani et al. (2004) [35]	3 months cardiac rehabilitation and exercise training with weight reduction	277 with coronary heart disease	---	↓	---
Okita et al. (2004) [11]	2 months aerobic training with weight reduction	199 healthy women	---	↓	---
Present study	9 months recreational training	33 with type 2 diabetes and insulin regimen	↑ ↑	n.s.	n.s.

Table 7. Author(s), year, type and duration of exercise training, and study population; increase (↑), decrease (↓), no measurement (---) or no significant change (n.s.) in plasma levels of TNF-alpha, CRP, and IL-6.

sCRP and IL-6

CRP is a blood inflammation marker, which may play a role in many chronic diseases, including heart disease, stroke, and diabetes. Sorting through available data about the clinical relevance of TNF- α , IL-6 and slightly raised CRP levels produces incomplete and sometimes contradictory information.

Several studies have shown that physical activity and cardiorespiratory fitness are inversely correlated to CRP [33] and that regular exercise significantly reduces circulating levels of CRP [11, 34]. Moreover, it is uncertain whether exercise has a direct effect on CRP levels independent of weight loss, which has been shown to reduce CRP levels consistently [36]. Several studies suggest that low physical fitness is associated with high levels of C-reactive protein (CRP), a marker of future cardiovascular events (see also Table 7).

Aronson et al. [37] could show a concomitant decrease of CRP levels with increasing levels of physical fitness in middle-aged subjects with metabolic syndrome. Exercise may have effects on weight, cardiorespiratory fitness, insulin sensitivity, lipid profile and immune system. Thus designing a clinical trial that examines the role of lifestyle interventions such as exercise in reducing CRP may

be inconclusive due to interacting effects. Few studies have examined the effect of exercise on elevated levels of inflammatory biomarkers in diabetic subjects and reported contrasting results in terms of efficacy and dependence on weight loss.

As most studies physical activity/exercise studies have been cross-sectional [4, 5, 6, 7, 33, 38] or have combined exercise with diet interventions [2, 21, 26, 39, 40, 41], it is presently unclear whether exercise training decreases CRP independently of weight loss. Moreover, the type, dose and intensity of physical long-term tolerated activity needed to obtain a significant anti-inflammatory effect in diabetes patients are largely unknown.

IL-6 is a cytokine involved in a number of immunological processes, but it is also linked to exercise and possibly energy status. During exercise, muscle IL-6 levels and plasma IL-6 levels are increased and further augmented when intramuscular glycogen levels are low. Recent studies have demonstrated that IL-6 is also released from adipose tissue in response to an exercise bout. Furthermore, IL-6 has been demonstrated to have a lipolytic effect, thus possibly playing a role in mobilisation of energy as free fatty acids (FFA) in response to exercise [42]. It has been hypothesized that IL-6 is released from skeletal muscle during exercise to act in a "hormonlike" manner and increases lipolysis from adipose tissue to supply the muscle with substrate [43].

In this study no relevant changes in s-CRP or IL-6 were seen. The recreational training two times a week did not decrease apparent factors of systemic inflammation. Maybe the intervention frequency and exercise intensity were not high enough. But considering the mean s-CRP baseline level of $4.14 \pm 3.4 \text{ mgxl}^{-1}$, it is a debatable point whether an increased inflammation status was even present. Insofar the inapparent exercise effect on s-CRP and IL-6 can not be assessed.

A close correlation between CRP levels and glycated haemoglobin (HbA_{1c}) has been reported, suggesting an association between glycemic control and systemic inflammation among patients with diabetes. The patients in our study were well controlled with a mean HbA_{1c} value of $6.4 \pm 0.76 \%$ (46.45 mmol/mol), so controlling blood glucose levels may have contributed to low CRP levels at baseline as well.

Effects on cardio-vascular risk parameters (lipid profile and blood glucose)

In this study the patients were moving towards a slight weight loss. In this regard the recreational training had limited effects on weight. But it should not be disregarded that the majority of the diabetic patients complained a constant weight gain before joining this program. Weight gain was also the most important trigger for the acceptance of the exercise program. Insofar stagnant weight or minor weight loss can be seen as a success. Further in some patients hypoglycemia occurred due to exercise and others are apprehensive of hypoglycemia. This in turn was a welcome justification for higher glucose intake before or after sports. Finally this kind of exercise training causes no higher weight loss without improved and reduced nutrition and sports adapted medical management. The aim of our study was to look at the effects of recreational exercise on inflammatory and lipid parameters without the diluting effects of controlling diet and losing weight, which are also seen to lower inflammatory markers. The nine months recreational exercise training had no effects on HbA_{1c} . This can be explained in the same way.

For most type 2 diabetic patients over 60 years of age, physical training is not a feasible form of therapy because of other interfering diseases which may complicate or severely hinder all physical training apart from very low intensity exercise programs. Type 2 diabetic subjects are predisposed to cardiovascular disease and are characterised by hyperlipidemia. This study shows that long-term low intensity training can markedly improve the blood lipid profile as measured by decreased levels of triglycerides, LDL, and total cholesterol.

In regard of the study subjects' low-density lipoprotein (LDL), cholesterol and triglyceride levels the nine months recreational exercise training resulted in marked improvements and protective effects, which are equivalent to a moderate drug or sustainable dietary intervention. The current guideline for LDL levels in individuals without systemic disease is $<4 \text{ mmolxl}^{-1}$. In individuals with diabetes the primary goal is an LDL $<2.6 \text{ mmolxl}^{-1}$. Compared to this goal, the higher mean LDL baseline level of 3.24 mmolxl^{-1} could be reduced by the recreational training to 2.88 mmolxl^{-1} and thus within the range of recommendations for diabetic individuals. The current goal of triglyceride levels $<1.7 \text{ mmolxl}^{-1}$ in individuals with diabetes is also nearly reached due to this long-term training (2.1 vs. 1.82 mmolxl^{-1} after 9 months). The HDL levels were higher than the current guideline of $>1.15 \text{ mmolxl}^{-1}$ at baseline (1.22 mmolxl^{-1}) and could be raised to 1.24 mmolxl^{-1} after the 9 months training period. The total cholesterol could be markedly reduced from 5.18 to 4.92 mmolxl^{-1} after 9 months and thus reached the primary goal of $<5 \text{ mmolxl}^{-1}$.

Although the subjects had a priori good medical lipid management, a further reduction of LDL, cholesterol and triglyceride levels within the range of current guidelines for diabetic people could be achieved by this long-term recreational training over 9 months.

Effects on cardio-circulatory system and endurance capacity

Cardiovascular disease represents the main cause of morbidity and mortality in patients with type 2 diabetes. The nine months low-intensity training was sufficient to obtain significant effects on cardio-circulatory parameters. The major effects were related to a significant improvement of the all day circulatory capacity by 103 %. This can be explained by a very low training intensity at the beginning because even low grade training exposure could be maintained only for few minutes by most patients. Training capacity after the 9 months recreational training was 56 ± 19.6 watt for 30 min. The endurance capacity of the diabetic patients was initially

limited by presence or high degree of complicating diseases, poor pre-training fitness and physical inactivity. The marked decrease in blood pressure (142.4 : 81.6 vs. 135.6 : 76.7 mmHg) near to the current guideline values of <130:80 mmHg due to recreational exercise training is equivalent to a moderate medical intervention and acts sustainable relieving on cardio-circulation. Further the heart stress resulting from the combined effects of blood pressure and heart rate was markedly reduced. The endurance capacity was improved by 103 % without an increased heart stress. This is best shown by the cardiac load (rate-pressure product divided by 1000). The rate-pressure product may be used as an index of myocardial oxygen consumption during exercise [44]. According to this parameter the myocardial oxygen demand during training had been reduced by about 50 %.

These quite impressive results may have their explanation in the extremely detrained status of the diabetic patients, when an even moderate training impulse creates a relevant stimulus of physiological reaction and has such marked and sustained cardio-circulatory effects.

5. CONCLUSION

This moderate exercise training program finally results in a 100 % higher cardio-pulmonary capacity after 9 months. The heart stress was reduced by 50 %. The significance of the increase in TNF- α levels by about 20 % remains unclear and requires further investigations

6. REFERENCES

1. Bastard JP, Maachi M, Lagathu C et al. (2006) Recent advances in the relationship between obesity, inflammation, and insulin resistance. *Eur Cytokine Netw* 17: 4-12
2. Heilbronn LK, Campbell LV (2008) Adipose tissue macrophages, low grade inflammation and insulin resistance in human obesity. *Curr Pharm Des* 14: 1225-1230
3. Nishimura F, Soga Y, Iwamoto Y, Kudo C, Murayama Y (2005) Periodontal disease as part of the insulin resistance syndrome in diabetic patients. *J Int Acad Periodontol* 7: 16-20
4. Geffken DF, Cushman M, Burke GL, Polak JF, Sakkinen PA, Tracy RP (2001) Association between physical activity and markers of inflammation in a healthy elderly population. *Am J Epidemiol* 153: 242-250
5. Ford ES (2002) Does exercise reduce inflammation? Physical activity and C-reactive protein among U.S. adults. *Epidemiology* 13: 561-568
6. LaMonte MJ, Durstine JL, Yanowitz FG et al. (2002) Cardiorespiratory fitness and C-reactive protein among a tri-ethnic sample of women. *Circulation* 106: 403-406
7. Church TS, Barlow CE, Earnest CP, Kampert JB, Priest EL, Blair SN (2002) Associations between cardiorespiratory fitness and C-reactive protein in men. *Arterioscler Thromb Vasc Biol* 22: 1869-1876
8. Festa A, D'Agostino JR, Williams K, Karter AJ, Mayer-Davis EJ, Tracy RP et al. (2001) The relation of body fat mass and distribution to markers of chronic inflammation. *Int J Obes Relat Metab Disord* 25: 1407-1415
9. Dos Santos MG, Pegoraro M, Sandrini F, Macuco EC (2008) Risk factors for the development of atherosclerosis in childhood and adolescence. *Arq Bras Cardiol* 90: 276-283
10. Visser M, Bouter LM, McQuillan GM, Wener MH, Harris TB (1999) Elevated C-reactive protein levels in overweight and obese adults. *JAMA* 282: 2131-2135
11. Okita K, Nishijima H, Murakami T et al. (2004) Can exercise training with weight loss lower serum C-reactive protein levels? *Arterioscler Thromb Vasc Biol* 24: 1868-1873
12. Lakka TA, Lakka HM, Rankinen T et al. (2005) Effect of exercise training on plasma levels of C-reactive protein in healthy adults: the HERITAGE Family Study. *Eur Heart J* 26: 2018-2025
13. Rush EC, Plank LD, Yajnik CS (2007) Interleukin-6, tumor necrosis factor- α and insulin relationships to body composition, metabolism and resting energy expenditure in a migrant Asian Indian population. *Clin Endocrinol* 66: 684-690
14. Zavaroni I, Numeroso F, Dongiovanni P et al. (2003) What is the contribution of differences in three measures of tumor necrosis factor- α activity to insulin resistance in healthy volunteers? *Metabolism* 52: 1593-1596
15. Behre CJ, Fagerberg B, Hulthen LM, Hulthe J (2005) The reciprocal association of adipocytokines with insulin resistance and C-reactive protein in clinically healthy men. *Metabolism* 54: 439-444

16. Zinman B, Hanley AJ, Harris SB, Kwan J, Fantus IG (1999) Circulating tumor necrosis factor- α concentrations in a native Canadian population with high rates of type 2 diabetes mellitus. *J Clin Endocrinol Metab* 84: 272-278
17. Pedersen BK, Bruunsgaard H (2003) Possible beneficial role of exercise in modulating low-grade inflammation in the elderly. *Scand J Med Sci Sports* 13: 56-62
18. Steensberg A, Fischer CP, Keller C, Møller K, Pedersen BK (2003) IL-6 enhances plasma IL-1ra, IL-10, and cortisol in humans. *Am J Physiol Endocrinol Metab* 285: 433-437
19. Puglisi MJ, Fernandez ML (2008) Modulation of C-reactive protein, Tumor necrosis factor- α , and adiponectin by diet, exercise, and weight loss. *J Nutr* 138: 2293-2296
20. Carey AL, Bruce CR, Sacchetti M et al. (2004) Interleukin-6 and tumor necrosis factor-alpha are not increased in patients with type 2 diabetes: evidence that plasma interleukin-6 is related to fat mass and not insulin responsiveness. *Diabetologia* 47: 1029-1037
21. Loria-Kohen V, Fernández- Fernández C, Bermejo LM et al. (2013) Effect of different exercise modalities plus a hypocaloric diet on inflammation markers in overweight patients: a randomised trial. *Clin Nutr* 32: 511-518
22. Nikseresht M, Sadeghifard N, Agha-Alinejad H, Ebrahim K (2014) Inflammatory markers and adipocytokine responses to exercise training and detraining in men who are obese. *J Strength Cond Res* 28: 3399-3410
23. Donges CE, Duffield R, Guelfi KJ et al. (2013) Comparative effects of single-mode vs. duration-matched concurrent exercise training on body composition, low-grade inflammation, and glucose regulation in sedentary, overweight, middle-aged men. *Appl Physiol Nutr Metab* 38: 779-788
24. Kim HJ, Oh JK, Kim C et al. (2013) Effects of six-week cardiac rehabilitation and exercise on adiponectin in patients with acute coronary syndrome. *Kardiol Pol* 71: 924-930
25. Libardi CA, De Souza GV, Cavaglieri CR, Madruga VA, Chacon-Mikahil MP (2012) Effect of resistance, endurance, and concurrent training on TNF- α , IL-6, and CRP. *Med Sci Sports Exerc* 44: 50-56
26. Reed JL, De Souza MJ, Williams NI (2010) Effects of exercise combined with caloric restriction on inflammatory cytokines. *Appl Physiol Nutr Metab* 35: 573-582
27. Andersson J, Jansson JH, Hellsten G, Nilsson TK, Hallmans G, Boman K (2010) Effects of heavy endurance physical exercise on inflammatory markers in non-athletes. *Atherosclerosis* 209: 601-605
28. Beavers KM, Hsu FC, Isom S et al. (2010) Long-term physical activity and inflammatory biomarkers in older adults. *Med Sci Sports Exerc* 42: 2189-2196
29. Balducci S, Zanuso S, Nicolucci A et al. (2009) Anti-inflammatory effect of exercise training in subjects with type 2 diabetes and the metabolic syndrome is dependent on exercise modalities and independent of weight loss. *Nutr Metab Cardiovasc Dis* 20: 608-617
30. Castellano V, Patel Dim White LJ (2008) Cytokine responses to acute and chronic exercise in multiple sclerosis. *J Appl Physiol* 104: 1697-1702
31. Lambert CP, Wright NR, Finck BN, Villareal DT (2008) Exercise but not diet-induced weight loss decreases skeletal muscle inflammatory gene expression in frail obese elderly. *J Appl Physiol* 105: 473-478
32. Kadoglou NP, Iliadis F, Angelopoulou N et al. (2007) The anti-inflammatory effects of exercise training in patients with type 2 diabetes mellitus. *Eur J Cardiovasc Prev Rehabil* 14: 837-843
33. Aronson D, Sella R, Sheik-Ahmad M et al. (2004) The association between cardiorespiratory fitness and C-reactive protein in subjects with the metabolic syndrome. *J Am Coll Cardiol* 44: 2003-2007
34. Goldhammer E, Tanchilevitch A, Maor I, Beniamini Y, Rosenschein U, Sagiv M (2005) Exercise training modulates cytokines activity in coronary heart disease patients. *Int J Cardiol* 100: 93-99
35. Milani RV, Lavie CJ, Mehra MR (2005) Reduction in C-reactive protein through cardiac rehabilitation and exercise training. *J Am Coll Cardiol* 45: 1563-1569
36. Selvin E, Paynter NP, Erlinger TP (2007) The effect of weight loss on C-reactive protein: a systemic review. *Arch Intern Med* 167: 31-39
37. Aronson D, Sheikh-Ahmad M, Avizohar O et al. (2004) C-Reactive protein is inversely related to physical fitness in middle-aged subjects. *Atherosclerosis* 176: 173-179
38. Albert MA, Glynn RJ, Ridker PM (2004) Effect of physical activity on serum C-reactive protein. *Am J Cardiol* 93: 221-225

39. Esposito K, Pontillo A, Palo CD, et al. (2003) Effect of weight loss and lifestyle changes on vascular inflammatory markers in obese women a randomized trial. JAMA 289:1799-1804
40. You T, Berman DM, Ryan AS et al. (2004) Effects of hypocaloric diet and exercise training on inflammation and adipocyte lipolysis in obese postmenopausal women. J Clin Endocrinol Metab 89: 1739-1746
41. Nicklas BJ, Ambrosius W, Messier SP, et al. (2004) Diet-induced weight loss, exercise, and chronic inflammation in older, obese adults: a randomized controlled clinical trial. Am Clin Nutr 79: 544-551
42. Keller C, Keller P, Marshal S, Pedersen BK (2003) IL-6 gene expression in human adipose tissue in response to exercise-effect of carbohydrate ingestion. J Physiol 550: 927-931
43. Holmes AG, Watt MJ, Febbraio MA (2004) Suppressing lipolysis increases interleukin-6 at rest and during prolonged moderate-intensity exercise in humans. J Appl Physiol 97: 689-696
44. Gobel FL, Norstrom LA, Nelson RR, Jorgensen CR, Wang Y (1978) The rate-pressure product as an index of myocardial oxygen consumption during exercise in patients with angina pectoris. Circulation 57: 549-556

Address for correspondence

Authors : Dr. med. dent. Antina Schulze - *Institute of Sports Medicine University of Leipzig*

E-mail : a.schulze@uni-leipzig.de

TEMPORAL PERCEPTION OF THE PERFORMANCE OF VOLLEYBALL PLAYERS IN THE COMPETITION

Mallek Anis

Institute of Sport and Physical Education of Sfax Tunisia

Abstract

The sporting life is like a race against the clock, or it must succeed and juggle multiple schedules workouts and competitions. Daily time management becomes a stressor. Our work aimed to investigate the joints of time training and competition time and sporting behavior and to analyze the functions and strategies of the cooperative life time management sports teams through cultural models that underpin them. The temporal behavior seems an important condition for performance and efficiency, which implies that their variability depends on the time management during competitions and training in volleyball. It seems that the construction of a specific temporality for sport could explain a second report on the performance of the subjects involved in volleyball practice.

Keywords: temporal behaviors - Time Management - Time Dimensions - Experience sports - culture.

1. INTRODUCTION

The temporal approach renews the perspective on sports teams usually seen in the spatial angle. Indeed, the sports organization in recent decades show that the time sport separates from everyday life with its autonomous rhythm and its own events, opposition time at work, a period of intense activity always more concerned specifically timed moment sport is clearly recognizable even today with its new direction. Our research work is to study first the joints time sports, coaching and temporal behavior of volleyball players and then analyze the functions of life and cooperation strategies in time management sports teams through cultural models that underpin them, and depending on the mode of engagement of volleyball players in their teams. In addition to the implications for time management training or competition, temporal behaviors also have an interest in understanding the attitude of the Tunisian volleyball players to their training. A baseline study for the exploration of attitudes related to time style sports is that of Mudrack in 1999 which combine the results in his study of past and current research, and affirmed the potential importance of the time structure and purpose in the study of organizational behavior.

The methodological approach to the problem

Development of Hypotheses

To properly answer all the questions of the problem, it should assumptions that are plausible but tentative answers.

Main hypothesis

The practice of volleyball for a long time affects the temporality in determining the performance and could determine the temporal behavior of Tunisian volleyball.

2. MATERIAL AND METHODS

The independent variables of the population

Our study population will consist of volleyball players from team sports, senior categories evolving in different divisions. They were divided to players who have spent more than five years (old) (n= 76) and players who have spent less than five years (new) (n= 54) men and women. This is to test the ability of segmentation or reclassification of individuals in the total sample of 130 players in their groups (n) and secondly the population extracts players across gender: 68 male and 62 female volleyball players.

The sports experience: Seniority

Sports part of our research will be distributed as follows: New player one that has less than 5 years in senior category and players who have more than 5 years old in senior category. Therefore, our variable sporting experience is dichotomized.

Gender:

It is also a dichotomous variable, which deserves to be studied and also seems important. The sample of volleyball players will be represented by both sexes in a representative way since we have accurate statistics of players studied the region of Sfax.

Measuring Instruments

Questionnaire

We use the questionnaire as a measure of psychosocial reactions vis-à-vis the relationship between temporality and sports performance. To measure the temporal dimensions that are number nine, forty items (questions) were used. The majority of these items were borrowed from those used in other research such as the French. The items are presented in a disorderly manner in the questionnaire and evaluated using measuring 5-point Likert corresponding to "strongly agree" to "not at all agree" the order of items and measurement scale (5 points) are the same in the French version and in our questionnaire.

Collection and validation of data

The distribution of questionnaires was conducted during the months of October, November and September 2012 questionnaires were distributed to athletes during training. Since respondents did not all have the level required to meet authentically, we took care to explain a few items to help the respondent to select the correct answer.

Sample

This study was conducted in a population of Tunisian volleyball players of the Sfax region (n=130 players) from different sex. Detailed information on the characteristics of the study sample information is presented in Table 1.

Tableau N°1: The description of the samples studied

	size	Experience	
		-5	5
man	68	42	26
woman	62	32	30
Total	130	74	56

Sample selection

The entire group of people concerned with the goals of our survey consists of players so team sports senior category in the region of Sfax. Our sample of athletes will be extracted from all 11 teams in the region of Sfax. The total sample of 130 athletes

The survey processing

Statistical analysis of data

After the description of our investigative tool and after the inventory of the types of samples of athletes, we feel it is useful to the description of data analysis methods. Analysis of the questionnaire data is performed by parametric statistics to know Student's test, analysis of variance of two factors (ANOVA), and the study of the correlation of Bravais Pearson

Student test

The comparison between the averages scores of our study population with those of French is performed by the Student t test for paired samples not.

Correlation coefficient

The Bravais Pearson correlation measures the strength of the relationship between the different temporal dimensions.

The two-factor ANOVA

The two-factor ANOVA used to identify the potential effects of our independent variables (sex, age) on each of the dependent variables (9 temporal dimensions)

3. RESULTS AND DISCUSSION

The time in our search

The perception of time is central, especially the behavior of players. This study was developed to try to identify the differences between the perceptions of time developed by athletes during training and competitions. The concept of time and therefore the apparent temporal behavior has been studied in the behavior of players in the management of volleyball teams. Time in sport can be

an entry in any sport process. It then needs to be allocated to the performance and the highest performance. Different time slots are to be used in such a way performance. Players maximize their total satisfaction by providing the unit time to an optimal activity unit; it to a sport based on time concept is perceived as linear, continuous and progress. We conducted research, aims above all to study the behavior of the players to strengthen the role of the concept of time. Multiple time dimensions have been identified and studied, such as the economic efficiency of time, the pressure of time, time orientation of the past, present and future. The organization of time; anxiety about time preference satisfaction, time pressure. These dimensions represent a notion of time that is both internal and external to the individual (individual and social time). In this study, we consider the following dimensions of time: The use mono / chronic time poly (**MONO**); procrastination (**PROC**), the organization of time (**ORGA**), the past temporal orientation (**PASS**), present (**PRES**) and the future (**FUTU**), timeliness (**WCP**), preference for immediate gratification (**GRA- IMM**) and time / quality ratio (**TEM / QUA**). The latter is a new dimension that we will include in this study.

Authors Kaufman and Lane categorized in type mono and poly chronological. According to research by Kaufman and Lane in 1991 in the Journal of Consumer Research, the single column style refers to players who used to do one thing at a time. The poly-chronic style, in contrast, refers to players who used to do several things simultaneously. For style single column, time is often perceived as linear and separable. These players prefer to focus only on training courses, often held at the predetermined program by the coach. According to the 1991 usinier research (in the Perceptual time patterns) may include in the poly-chronic style in the world of sport, players can edit and easily give up their program and a pre workout plan; communicate with several people at the same time and do not hesitate to deal with multiple tasks simultaneously. According to Feldman and Hornik in 1981, adopting a style or other players depends on many factors: Gender and goals in the sports season, the level of education, employment status the social activity, the influence of family and culture.

Procrastination usually refers to the tendency to give a task or decision until later or tomorrow. This trend seems to be all individuals according Tukman in 1989. Regarding the driving behavior, this concept is defined as chronic, is to delay or slow down the training process.

The time orientation (past, present and future), these dimensions are widely studied in psychological research. According **Bargadaa in 1989** temporal orientation of an individual is defined as a preference to see one of three time zones.

The temporal organization of time denotes the habit or the need to organize and plan the activities of individuals. This dimension is often associated with the concept of economic efficiency of time as explained in the research usinier Building a perception of time scale in 1991 may deduct as sports that tend to organize daily workouts are those of you who see time as money.

Punctuality refers to the behavior of being on time for training and competition. This dimension which Brodowsky and Anderson recently identified in the study in their research in 2000 which is a cross-cultural study of consumer attitudes towards time in the Journal of Global Marketing.

The preference for immediate gratification was founded by owner of the factory in 1994. This dimension describes the aspect of motivation attached to the notion of time. There are two types of people, those who favor prompt or immediate results and favoring an immediate reward, others prefer or may take some time to get results.

The quality / time is the idea of many these people looking to make their work rather than chasing time; if the requirement of a good quality or effectiveness of the task could be the cause of this behavior.

Correlation analysis between the temporal dimensions in volleyball

To investigate the relationship between the temporal dimensions, we used the correlation study for ease of interpretation. The option of this method of analysis was chosen to verify the correlation coefficient between the temporal dimensions and their corresponding factors and produce scores using database for subsequent operations. Thus, by this, eight out of nine selected temporal dimensions have proven highly correlated with higher or lower coefficients of 0.05 for accuracy; refer to the results found in

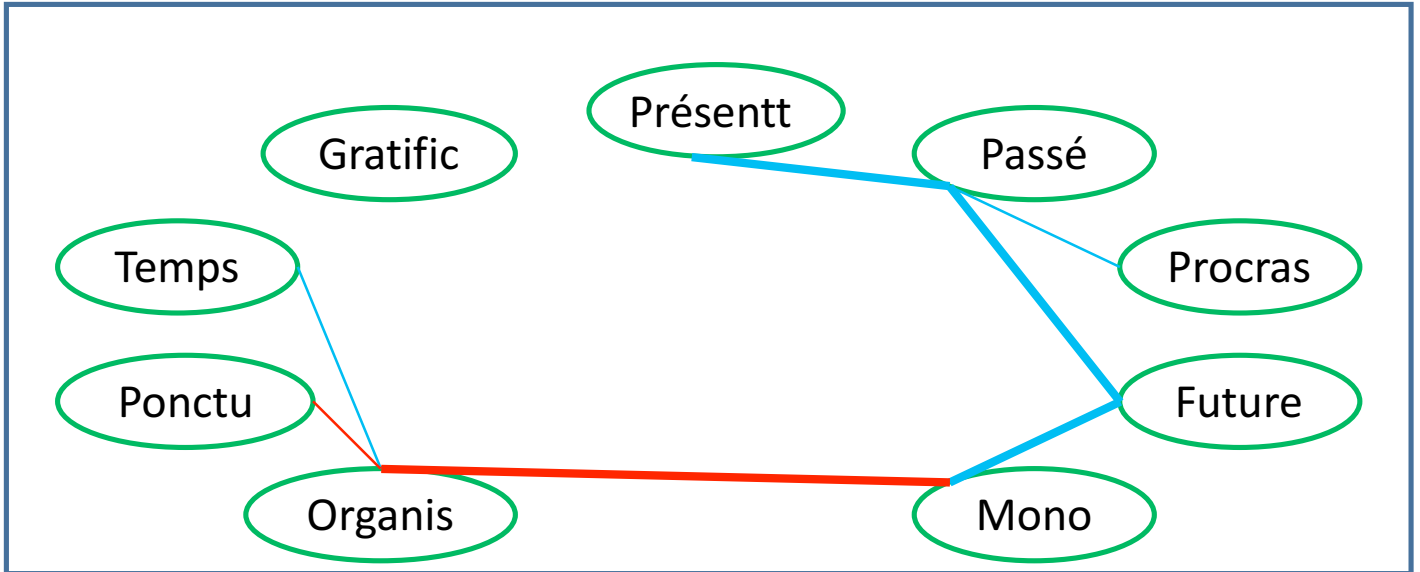


Figure 1: Schematic representation of the correlation between the temporal dimensions. The blue color is a positive correlation and red negatively correlated. Thin lines suggest correlations at $P < 0.05$ and the bold lines correlations at $P < 0.01$.

In addition to the implications for time management training and competition, the temporal behavior survey also has an interest in understanding the attitude of Tunisian volleyball players to their training. A baseline study for the exploration of attitudes related to volleyball activity inspired by the idea of time Mudrack style in 1999.

The results of our study, significant correlations were found between the volleyball in the spirit of competition and some temporal behavior such as time organization and persistence over time of procrastination. In our study, there are links between the organization of time, procrastination one hand and orientation to the past, the need for a second job. The approximation of the results found in our current study allows us to say that former volleyball players of the senior class have a strong spirit of training related to competition, which is again confirmed by their strong need to achieve in competitions. That said, they show good attitudes to their popular sports. This trend is consistent with other empirical study, that of Nguyen and Napier in 2000 in their research Nomee Work attitudes in Vietnam. Tunisian volleyball players show a generally positive values training as find in our search results. Volleyball players are ready to train hard to support their teams during the sports season.

Finally, with regard to internal relations within the team, understand and respect the nostalgic notion of volleyball players are needed to create a good atmosphere for cooperation in training and competition, as volleyball players are very attached and proud of their past or their families accompanying them as shown by the scores of questions 8 and 4.

Table 2: Matrix of inter-correlations between the time

future	R	1							
	P	-							
Instant gratification	R	-0.05	1						
	P	0.61	-						
monochronic	R	0.286	-0.030	1					
	P	0.001	0.737	-					
Organization of time	R	-0.044	0.120	-0.227	1				
	P	0.617	0.172	0.009	-				
past	R	0.255	0.107	0.078	0.011	1			
	P	0.003	0.225	0.378	0.905	-			

punctuality	R	0.065	0.092	0.160	- 0.203	- 0.028	1			
	P	0.459	0.297	0.068	0.021	0.754	-			
present	R	0.043	0.134	- 0.086	0.070	0.285	- 0.101	1		
	P	0.627	0.129	0.331	0.43	0.001	0.255	-		
procrastination	R	0.036	0.089	- 0.099	0.008	0.192	- 0.062	0.086	1	
	P	0.681	0.316	0.261	0.93	0.028	0.484	0.329	-	
Time / Quality	R	- 0.084	0.139	- 0.087	0.196	0.021	- 0.053	0.172	- 0.019	1
	P	0.34	0.115	0.323	0.026	0.813	0.546	0.051	0.827	-
		future	Instant gratification	monochronic	Organization of time	past	punctuality	present	procrastination	Time / Quality

The blue color represents a positive correlation. The red color represents a negative correlation.
P: Probability A: Correlation coefficient

These eight dimensions retained explain the total variance of proc dimensions, MONO, PASS, ORGA, TEM / QUA, WCP, GRA-IMM and future. The components of these factors are very consistent with those selected. Bravais Pearson correlation coefficient measures the factors identified in this study and the degree of correlation between the temporal dimensions; there are those who have coefficients above 0.05 the correlation is positive (TEM / QUA, ORGA, MONO, FUTURE, PROC, PASS EC) have no coefficients less than 0.05 the correlation is negative: (WCP, ORGA, MONO). These factors have a good reliability with high coefficients of 0.05 while the other factors have relatively lower coefficients of 0.05. These factors (POC ORGA, MONO) to after our research could be challenged for their low correlation. However, these factors were selected for this study because each of them represents a very specific aspect of perception and measurements of temporal elements of each are supposed characterized the style of both temporal. As regards the comparison in terms of size, we find that there are differences between men and women, old and new. The results show that the comparison of old and new players volleyball in the senior category in the sample, we find that the former tend to encourage the habit of doing one thing at a time (MONO) they lean more to the future. While the new show a less ad hoc trend (WNCP). They lean more toward the past (PASS)

Comparison between the temporal behavior of men and women volleyball players

Another statistical treatment is to compare the temporal dimensions between two populations volleyball men and women volleyball players. The results of this operation, shown in Figure2, show that the averages are statistically significantly different between the two, there are three dimensions that the difference is significant that they are those of **MONO**, **ORGA** and **PASS** the nostalgic trend is stronger in women than in men's volleyball. As for men, this can be explained by the reason that Tunisian with a strong tradition, in which the family and the group are very important for the individual in general.

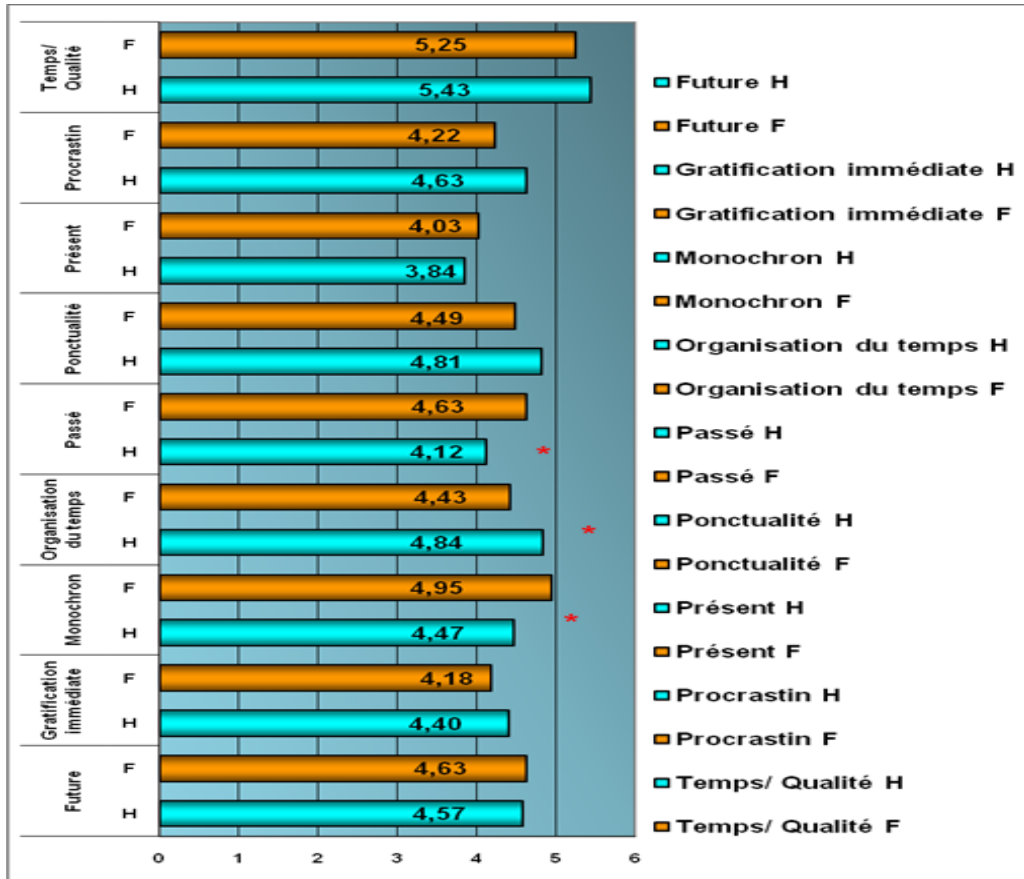


Figure 2: Comparison of means between the temporal behavior of sports men and women

But usually Tunisians are more nostalgic than the French. The focus on the past is often appreciated by society. Finally, say **MONO** dimensions, **ORGA** and **PAST** the difference of means in our research is significant for men. In organizational procedures which is predetermined in the implementation of training and competition tasks, the latter show a little more attention to the quality of work as speed.

The first reading of the results shows indeed the interest of time budget for the study of temporal behavior of Tunisian players and share experience in time management and regulation of the temporal system within a sports institution. We see already from the temporal dimensions and the results of the difference in means that overall, male and female players in their teams continue to behave in a linear time model of progress characterized by punctuality, time /quality, present and future.

The comparison between the different classes men and women, old and new shows significant differences in the behavior which indicates that former players (male or female) are best qualified to manage their time better than the new players who have fewer years of experience. A more detailed analysis would show that the difference in average temporal dimensions shows that the trend is towards a linear temporal model of progress, promoting a fast time performance, a time that characterizes the model of contemporary technology companies, the Becoming increasingly competitive.

Discriminant analysis on the difference in means between the temporal behavior of old and new players

This analysis is intended to be a discriminant function with time factors that divide the population of players who have spent more than five years in the team (former) and which number 76 and players who have spent less than five years (new) number of 54 men and women. This is to verify the ability of segmentation or reclassification of individuals in the total sample of 130 athletes in their groups (n) and secondly the population of players separated across gender: 68 men and 62 women athletes.

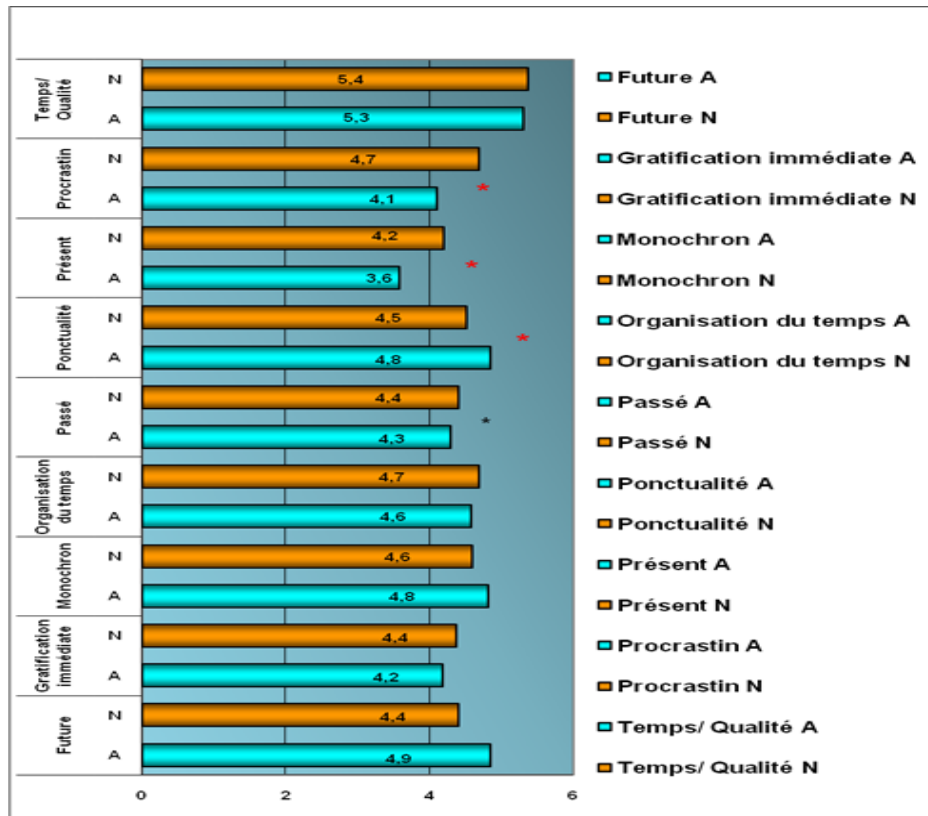


Figure 3: Comparison of means between temporal behavior Former and new players.

The segmentation criteria considered explanatory variables are the 9 time factors; the statistical descriptions of these variables for the two samples such that their medium in two groups are shown in Figure 3 above. Besides the interest of building a discriminant function to clarify the difference between the temporal behaviors of old versus new players is to indicate the part of the experience in time management. The difference in means was very significant for the future and punctuality and to the former. In this section, following discussions on the results we will present the implication of this study in time management teams. These discussions relate particularly to the most influenced by the temporal behavior of sports and the human factor plays a decisive role disciplines. At first we see that the results obtained in our study are consistent with those found in some previous research about the time. Thus, the actual behaviors of individuals sporting objects of our Tunisian culture study meet the temporal behavior of non-sporting French. Indeed, regarding the chronic mono style in the use of time our research shows that respondents from the new-class athletes are less than the old mono chronic respondents.

This result explains the different temporal dimensions of his research on the sociology of the time. Indeed, regarding the habits of the organization of training and competition, the study shows that the ancient respondents often organize their activities ahead of the new. This result is consistent with the actual behavior in the absence of new used for training on time, while in the former, the appointments are essential to progress. Rating listed in Figure 3 show that the difference is significant at the middle first. There is a significant difference in favor of the former on procrastination with a value of (4.8) for the old and (4.5) for the new and future value of the average scores which is (4, 9) for the old and (4.4) for news. Indeed, our results indicate that the sports less organized daily activities and it is very important to emphasize that they do not usually practice by appointment. This tradition could be explained not only by the lack of communication, but also the traditional mechanism of the organization of the team that is not very interested in the temporal strategies although it can participate in regulation time and budget the notion of lifestyle team our results are similar to that made by tung dao (2005) in his thesis. The difficulty is to find a suitable time to drive through the harmonization of the time the daily life and the life of a player, attract an adequate program for all members, to find a consensus between training schedules and work and study schedules. Since former players appreciate the quality rather than speed. Regarding the Opposition made an immediate reward by the elders, the projects have potential benefits in the medium and long term seem more interesting and attractive than those whose results are apparent in the short term. This behavior is explained by the share of experience in time management and the application and implementation of the training program and competition during the sports season to achieve the desired performance. Finally, learn to improve and focus on its past due to the sport experience also indicates a greater appreciation of the former, because it is the proposal to consider the past as rewarding (such as feedback effect in achieving sports performance) our explanation is close to that

made by tung dao (2005) in his thesis entitled "Time doctora style and sense of self-efficacy of the buyer on the purchasing decisions of style."

Comparison of means about temporal dimensions: the case of Tunisian and French

The first statistical analysis is to compare the average measurements of items. The results presented in Table number 3 with averages, standard deviations and values of the t-test, show that the averages are statistically significant, demonstrating differences by comparing them with other research done on a French population unsportsmanlike.

Table 3: Comparison of averages; The case of the Tunisian and French

	Items	French		Tunisien		T-test
		Mean	Standard deviation	Mean	Standard deviation	
17	I know what I want for my future and I know how to get there (FUTU)	4.42	1.92	5.71	1.38	-7.49* *
21	I like to discover how others see the future (FUTU)	4.99	1.6	6.14	1.28	-7.71* *
26	I think one day I will have success (FUTURE)	4.12	1.75	2.75	2.15	6.81* *
39	Many of us tend to "dream" about their future, it happens to me (FUTU)	5.54	1.48	3.88	1.80	9.81* *
40	I often think about what I will do in the future (FUTU)	5.43	1.5	4.52	1.64	5.60* *
6	It is best to conduct tasks that bring results quickly (GRA_IMM)	3.54	1.36	4.47	1.65	-5.97* *
27	Working on projects whose results are achieved long-term de-motivates me (GRA_IMM)	3.22	1.59	3.39	1.94	-0.95
32	I prefer to wait in the hope of receiving a large reward later rather than touch a little now (GRA_IMM) has	3.4	1.66	3.39	1.94	0.04
41	I prefer to do two or more things that can be done quickly rather spend my time on a big project (the result of which is seen in the long term) (GRA_IMM)	3.35	1.56	5.92	1.33	-17.27** *
7	People should not try to do several things at once (MONO)	3.54	1.7	2.96	2.07	2.97* *
13	I often try to do more than one thing at a time (MONO) has	3.64	1.78	4.25	1.71	-3.42* *
15	When I got to my office, I work on one project at every moment (MONO)	4.76	1.75	6.25	1.25	-9.50* *
34	I feel comfortable in doing several things at once (MONO)	4.09	1.51	3.66	1.86	2.46*
38	I hate to do several things at once (MONO)	3.59	1.76	6.35	1.22	-17.74** *
2	Good time management is the key to success (ORGA)	5.14	1.32	5.12	1.51	0.17
11	I feel uncomfortable by following a schedule set time (ORGA) has	4.97	1.72	2.10	2.02	14.87* *

12	I prefer to have a schedule determined time and keep me (ORGA)	4.41	1.74	4.63	1.62	-1.28
25	I have a very great control on how I take my time (ORGA)	3.41	1.45	5.92	1.33	-17.57** *
29	I used to do what comes to mind, rather than think of several things to do in advance during the day (ORGA)	4.27	1.78	5.44	1.44	-7.02* * *
4	It is very important to know what happened in the past (PASS)	5.22	1.64	6.41	1.21	-8.02* * *
8	We should teach children traditions (PASS)	4.65	1.7	4.95	1.55	-1.82
18	When I am alone, my thoughts often turn to the past (PASS)	3.93	1.9	5.06	1.52	-6.39* * *
22	I am nostalgic of the past (PASS)	3.83	1.84	4.52	1.64	-3.86* * *
23	I always take time to think about the opportunities I have missed (PASS)	3.52	1.85	2.69	1.94	4.24* * *
31	I love listening to older people talking about their past (PASS)	4.61	1.81	2.53	1.97	10.68* * *
1	No possible excuse for the delay (WCP)	2.78	1.67	6.41	1.21	-24.22** *
14	I'm almost never late for work or an appointment (WCP)	4.88	2.08	4.63	1.62	1.30
28	I prefer to come early and wait rather than being late for an appointment (WCP)	5	2.06	5.44	1.44	-2.40*
36	If the only way to get to an appointment is to run, I prefer to be late (WCP)	5.39	1.97	2.15	2.41	14.31* * *
24	I think some of the future and the past, I saw this time (PRES)	3.87	1.78	4.04	1.76	-0.93
33	I do not like change (PRES)	2.86	1.65	4.31	1.69	-8.42* * *
37	I live from day to day (PRES)	3.95	1.86	3.45	1.92	2.59* * *
16	When I have time on my hands, I wait until the last minute (PROC)	4.48	2	4.85	1.57	-1.98*
19	I used to do things at the last moment (PROC)	4.62	1.95	5.17	1.50	-3.07* * *
20	Face difficult and painful decisions, I tend to give them to the latest possible (PROC)	4.39	1.88	5.33	1.46	-5.43* * *
30	My motto: Do not postpone until tomorrow what can be done the same day (PROC) has	4.42	1.84	2.91	2.09	7.46* * *
35	When a task is difficult to do, I think it is good to delay (PROC)	2.96	1.65	3.93	1.79	-5.49* * *
3	It is impossible to do together quickly and well (TEM_QUA)	3.37	1.8	6.14	1.28	-17.25* * **
5	It is more important to do things correctly than to	5.86	1.25	6.25	1.25	-3.00* * **

	do them quickly (TEM_EFF)					
9	Work looking at his watch never brings good results (TEM_QUA)	3.82	1.97	4.20	1.72	-2.00*
10	The quality of work depends on the time invested in this work (TEM_QUA)	4.36	1.85	4.79	1.58	-2.44*

Means and standard deviations found in your research are relatively close to those found on a French population. However, the temporal dimensions show some differences between the two cultures. The results go up that, in comparison with the French sample, Tunisian players tend to favor the habit of doing one thing at a time (mono chronic), to devote their time to do their job (time / quality) and not to call a later spot (procrastination). It also appears that the French prefer to complete large projects that provide medium to long-term results rather than projects that bring immediate results (GRA-IMM), yet Tunisian athletes better organize their days in advance (ORGANIZATION). Finally, Tunisian players will lean more toward the past (PASS), less to the future and are more punctual (WCP) than French. The results obtained in our study are consistent with those found in some previous research about the time, especially with the real behavior of individuals of both cultures. In sport, it is clear that a good knowledge of the psychological characteristics of sport in general and those related to time perception are of particular relevance for good efficiency of training and competition, therefore satisfaction to athletic performance, from the Tunisian players. This observation suggests that efficient allocation of tasks in the Tunisian context must respect their chronic mono style because as shown in the results in Figure 4,

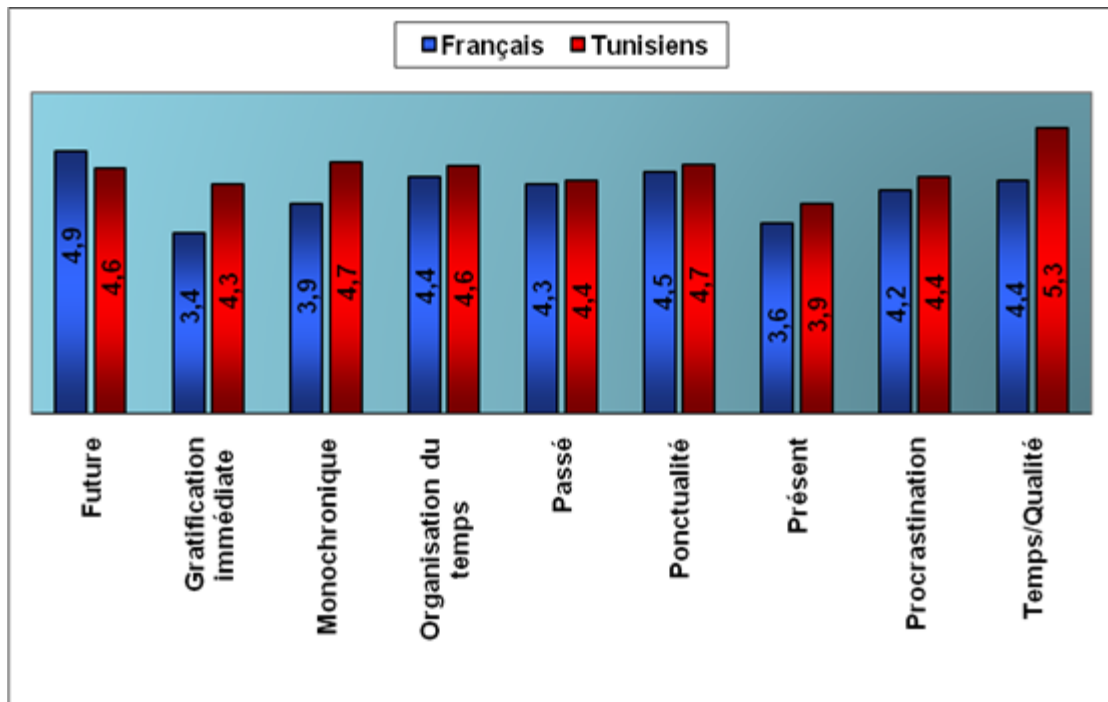


Figure 4: Comparison of the temporal behavior of Tunisians and French

Tunisians tend to favor mono-chronic use of time. A rigorous analysis of the nature of the positions of the players in training and competitions and the sports-time use of style will ensure a good sport performance. This trend could be explained by the fact that Tunisians are moving towards quality and effectiveness of training, rather than speed which gives dissatisfaction with the results.

Effect of temporal behavior on the volleyball performance

In this area, it is clear that a good knowledge of the psychological characteristics of sport in general and those related to the perception of time, in particular, is very useful for a good effectiveness of training and competition. Indeed, it is clear that a single chronic promoting sports style would feel comfortable trying to do more than one thing at a time. If that player is forced to do things with chronic poly, the effectiveness of its tasks could not be ensured without competition. of our research after a rigorous analysis of the nature of the exercises and the use of the time players style will ensure good recruitment for the report as TEM / QUA, former players focus on quality that is ie, the effectiveness of training and competition point of view of performance, rather than the speed workouts,

and therefore, the pressure in the tasks could influence the effectiveness of the training and competition and also after the performance of our results by correlation of temporal dimensions. Regarding the continuing work in training, former players show less procrastination than new players, this behavior can lead to positive attitudes, sometimes negative performance for our results is similar to that made by Tung Dao (2005) In His thesis Entitled "Time doctora style and sense of self-efficacy of the buyer on the Purchasing Decisions of style.". The positive effect is obviously the need for achievement drives; that is to say, complete the task before leaving the sessions. The negative effect occurs if players leave voluntarily simply do nothing about what they feel they complete a new task in the remaining time. This negative behavior was observed during training during the last minutes of the session. The abuse of this behavior is very dangerous for the team. This requires that leaders must find appropriate measures to promote the positive and mitigate the negative effects of this behavior are to give recommendation to minimize the negative effects.

One solution might be moving forward, is the application of flexible schedules or less stringent (if training permits), that is to say, the player can leave the workout before time if he did not feel usefully lead to or stay in the field to finish his current training program if desired. Finally, the lack of experience in the organization of the team is also a negative for the former and could cause difficulties in performing the tasks. To remedy this weakness, a rigorous and strict organization of training could be an effective solution.

Finally, with regard to internal relations within the team, understand and respect the past players are needed to create a good atmosphere for cooperation in training and competition since the sport are very attached and proud of their past, or Family (as shown by the scores of questions 8 and 4).

Thus, as indicated by the results of our investigation, players least organize their daily activities. Indeed, it is very important to emphasize that they do not have the habit to practice on appointments or strict time frame established in advance.

The difficulty is to find a suitable time for consistent workouts since ancient appreciate the quality rather than speed. Concerning the opposition made an immediate reward by the elders, the projects have potential benefits in the medium and long term seem more interesting and attractive than those whose results are apparent in the short term. Finally, learn to enhance and emphasize his past in terms of sports experiences also get a better appreciation of the elders, as this is the tendency to view the past as rewarding.

In sport, many studies on the temporal behavior of players have been performed, and the impacts of temporal perception on behavior in training and competition players were justified. The application of the temporal characteristics of the Tunisian players is considered very useful, sometimes essential in sport in clubs.

4. CONCLUSIONS

This empirical study provided a comprehensive view against the temporal dimension of the Tunisian culture. According to the results, Tunisian players are characterized by a fairly linear temporal style, progress and performance. For Tunisian culture, this empirical study is probably the first on this topic: time. It provides an update on the temporal dimension of this culture. These results provide important contributions to sports teams in Tunisia, including time management and organization of the team on the player performance plan. The flexibility in the use of time is an important point to discuss here. Although it is not directly measured in this study, we could see a lot of flexibility in the time growing Tunisian players through some time already measured behavior: a low degree of organization, punctuality with the great need for achievement tasks. Taking into account the flexibility is very useful for teams in the development of programs related to training schedules.

In short, this research, although it does not specifically address the sample of workers, at least gives coaches and team leaders to reflect on the impact of temporal style of individuals in their behavior during training.

5. REFERENCES

- **Agarwal.A., ET Tripathi.K.,** Temporal orientation and deprivation, *Journal of Psychological Research*, (1980), vol. 24, pp.144-152.
- **MatthewV.,C., AliceF.S.,TreenaL., S.,** et The impact of time pressure in negotiation: a meta-analysis, *The International Journal of Conflict Management* (1998), vol. 9, n° 2, pp.97-116
- **Acte du colloque.** Anthropologie du sport. Perspectives critiques. Publiés sous la direction de Jacques et Jean-Marie Böhm, Paris-Sorbonne., 19-20 Avril 1991. **A.F.R.S.E.**
- **Bourdieu. P.,** Question de sociologie Cérès productions, idée, Cérès Production Tunis1993, pour la présente édition. I.S.B.N. 9973-19-050-5 Imprimé en Tunisie.
- **Becker.G.,** Théorie of allocation of time, *The Economic Journal* (1965), vol. 299, pp.493-517
- **Bergadàa M.** Le rôle du temps dans l'action du consommateur, Thèse de Doctorat, Université de Québec (1987).
- **Bergadàa. M.,** Le temps et le comportement de l'individu (première partie), *RAM : Recherche et Applications en Marketing*(1988), vol. 3, n°4, pp.57-72.

- **Bergadåa. M.**, Le temps et le comportement de l'individu (deuxième partie), *RAM : Recherche et Applications en Marketing*(1989), vol. 4, n°1, pp.37-55.
- **Bergadåa. M.** the role of time in the action of consumer, *Journal of Consumer Research* (1990), vol. 17, pp. 289-302.
- **Bergadåa. M.**, Cognitive temporal system of the consumer: structures and organisations, papier de recherche n° 91023, soumis pour publication au *Journal of Consumer Research* (1991).
- **Bond.M.,J.**, and **Feather N.T.**, some correlates of structure and purpose in the use of time, *Journal of Personality and Social psychology* (1988), vol. 55, n° 2, pp. 321-329.
- **Brodowsky. G, H, & Anderson B.B**, A cross-cultural study of consumer attitudes toward time, *Journal of Global Marketing*(2000), vol. 13, n° 3, pp. 93-109
- **CLEMENT. J., P, Defrance. J., et Pociello., C.**, Sport et pouvoirs au x x e siècle Enjeux culturels, sociaux et politiques des éducations physiques, des sports et des loisirs dans les sociétés industrielles, (années 20 années 90), Presses Universitaires de Grenoble, 1994.
- **Chaabouni. J., zghal. R** (eds) LA PERFORMANCE Théorie, Perceptions, Pratiques Actes du colloque organisé par l'Équipe de recherche en gestion FSEG-Sfax-1992.
- **CORBIN. A.**, L'avènement des loisirs 1850-1960., avec la collaboration de, Julia Csergo, Jean-Claude Farcy, Roy Porter, André Rauch, Jean-Claude Richez, Léon Strauss, Anne-Marie Thiesse, Gabriella Turnaturi, Georges Vigarello. Aubier (Paris) _ Laterza (Rome) 1995.
- **Cronbach.L., J.**, Coefficient Alpha and the internal structure of Tests, *Psychometrika* (1951), vol. 16, pp. 297-334.
- **Darpy. D.**, Une variable médiatrice du report d'achat: la procrastination, in 13^{ème} Congrès de l'AFM, Toulouse, AFM (1997).
- **Darpy. D.**, Importance de la procrastination dans le processus de décision d'achat : approche sémiotique et mesure, Cahier de Recherche, N° 284, Dauphine (2000).
- **Demany. L.**, L'apprentissage perceptif des structures temporelles chez le nourrisson, du temps biologique au temps psychologique, PUF, « *Psychologie d'Aujourd'hui* » (1979), p. 217-226.
- **Divard. R.**, et **Robert.P.**, La nostalgie: un thème récent en marketing, *RAM : Recherche et Applications en Marketing* (1997), vol. 12, n°4, pp. 41-61.
- **Feather.N., T.**, ET **Bond.M.,J.**, Time structure and purposeful activities among employees and unemployed graduates, *Journal of Occupational Psychology*(1983), vol. 56, pp. 241-254 .
- **Feldman.L., P.**, ET **Hornik. J.**, The use of time: an integrated conceptual model, *Journal of Consumer Research* (1981), vol. 7, pp. 407-419.
- **FerrariJ.R.,Johnson,J., L.**, ET **McCown,W.**,*Procrastination and task-avoidance: theory, research and treatment*, New York: Plenum (1995).
- **Gary,K.**, and **Gentry,J., W.**, The development of time orientation measures for use in cross-cultural research, *Advances in Consumer Research* (1991), vol. 18, pp. 135-142.
- **Graham,R., J.**, The role of perception of time in consumer research, *Journal of Consumer Research* (1981), vol. 7, pp. 335-342.
- **Greenleaf,E.**, ET **Lehmann,D.**, Causes of delay in consumer decision making: an exploratory study, *Advances in Consumer Research* (1991), vol. 18, pp. 470-475.
- **Gurvitch. G.**, La vocation actuelle de la sociologie. Tome second Antécédents et Perspectives. Presses Universitaires de France 108, Boulevard Saint-Germain, Paris 1969.
- **Hirschman, E., C.**, Theoretical perspectives of time use: implications for consumer research, *Research in Consumer Behaviour* (1987), vol. 2, pp. 55-81.
- **ISABEL QUEVAL.**S'accomplir ou se dépasser. Essais sur le sport contemporain Nrf Editions Gallimard.,Bibliothèque des sciences humaines. Edition Gallimard, 2004.
- **Jones, J., M.**,Cultural differences in temporal perspectives, in *The Social Psychology of Time: News Perspectives*, ed. Joseph E. McGrath, Newbury Park, Sage Publications (1988), p. 21-38.

- **Kaufman, C., F., Lane, P., M.**, exploring more than 24 hours a day: a preliminary investigation of polychronic time use, *Journal of Consumer Research* (1991), vol. 18, n° 3, pP. 392-402.,
- **Kaufman, C., F., Lane, P., M.**, The intensions and extensions of the time concept: contributions from a sociological perspective, *Advances in Consumer Research* (1990), vol. 17, pp. 895-901.
- **LINTON. R.**, LE FONDEMENT CULTUREL DE LA PERSONNALITE., Traduit de l'américain par Andrée Lyotard.,Préface de Jean-Claude Filloux, Première traduction française : Dunod, 1959
- **Mauss. M.**, Sociologie et anthropologie, Précédée d'une introduction à l'œuvre de marcel Mauss Par, Claude levy-Strauss Professeur au collège de France, Presses Universitaires de France, 1950 Sociologie d'Aujourd'hui.
- **Manrai,L.,A., ET Manrai,A.,K.**, Effects of cultural-context, gender and acculturation on perception of work vesus social/leisure time usage, *Journal of Business Research* (1995), vol. 32, pp. 115-128.
- **McGrath,J., E., ET Kelly,J.R.**,*Time and Human Interaction*, New York: Guilford(1986).
- **Merleau-Ponty, M.**,*Phénoménologie de la perception*, Ed. Gallimard, (1945) Bibliothèque des Idées
- **Mudrack,P., E.**, Time structure and purpose, type A behaviour, and the Protestant work ethic, *Journal of Organizational Behaviour.*(1999), vol. 20, pp. 145-158.
- **Nickols, S.Y., and Fox, K.**, Buying time and saving time: strategies for managing household producing, *Journal of Consumer Research* (1983), vol. 10, pp. 197-208.
- **Pierre,D., et Surinder, D.P.S.**, *La négociation interculturelle*, Chotard(1987).
- **Pociello. C.**, Sport et société : approche socioculturelle des pratiques
- Avec la collaboration de : W. Andreff, J.-P. Augustin, M., Berges, M. Bernard, J. Defrance, F. Di Ruzza, J. Durry, P. Falt, Cl. Fleuridas, B. Gerbier, J. Guilherme, L. Herr, P. Irlinger, C. Louveau, M. Métoudi, G. Vigarello. Dépôt légal mai 1998 – n 53.
- **Ravi,D. ET Stephen,D.**, The effect of time pressure on consumer choice deferral, *Journal of Consumer Research* (1999), vol. 25, pp. 369-389.
- **QUEVAL. I.**, S'accomplir ou se dépasser. Essai sur le sport contemporain,Nrf Éditions Gallimard.,Bibliothèque des sciences humaines. Edition Gallimard, 2004.
- **Tuckman, B.**, Procrastination busting, *EducationalTechnology*(1989), vol. 29, n° 3, pp. 48-49
- **Tuckman,B.**, The développement and concurrent validity of the procrastination scale, *Educational and psychological Measurement*(1991), vol. 51, pp. 473-480
- **Urien, B.**, Tentative d'interprétation temporelle du comportement exploratoire du consommateur, Thèse de Doctorat de l'Université de Rennes1 (1998), pp. 17
- **Usinier, J.C., et Valette-Florence P.**, Construction d'une échelle de perception du temps: résultats préliminaires, Cahier de Recherche, CERAG, (1991) 91-11, pp. 1-17.
- **Usinier, J.C., et Valette-Florence.,** Perceptual time patterns (« time styles ») : a psychometric scale, *Time & Society* (1994), vol. 3, n° 2, pp. 219-241
- **Usinier J.C., ET Valette-Florence.,** Business time perceptions and national cultures: a comparative survey, *Management International Review*, (1991) vol. 31, n° 3, pp. 197-217.
- **Usinier, J.C., et Valette-Florence,** Time-styles in two cultural settings : the tunisien case, Cahier de Recherche du CERAG 92.15, Ecole Supérieure des Affaires, Université de Grenoble (1992), pp. 1-16.
- **Tuan V. and Napier, N.K. (2000a).** Paradoxes in Vietnam and the United States: Lessons Earned: Part I. In Human Resource Planning Journal, 23, (1), 7-9.53.
- **Vu, Tuan V. and Napier, N.K. (2000b).** Paradoxes in Vietnam and the United States: Lessons Earned: Part II. In Human Resource Planning Journal, 23, (2), 9-10. 54.
- **Vu, Tuan V. and Napier, N.K. (2000c).** Paradoxes in Vietnam and the United States: Lessons Earned: Part III. In Human Resource Planning Journal, 23, (3), 9-10. 55.

- **Nguyen, V. T and Napier, N.K., (2000).** Work attitudes in Vietnam. Academy of Management Executive, 14, (4), 142-143.56.
- **Harvey, M., Ralston, D. and Napier, N.K. (2000).** International Relocation of inpatriate managers: Assessing and facilitating acceptance in the headquarters organization. In International Journal of Intercultural Relations, 24, 825-846. 57.
- **Peterson, R.B., Shim, W. And Napier, N.K. (2000).** Expatriate Management – A comparison of MNCs across four parent companies. In Thunderbird International Business Review, 42, (2), 145-166.
- **Hornik in 1981 Subjective vs. Objective Time Measures: A Note on the Perception of Time in Consumer Behavior** Jacob Hornik Journal of Consumer Research Vol. 11, No. 1 (Jun., 1984), pp. 615-61
- **tung dao in 2005,** thèse de doctorat de l'université de renne ; influence du style temporel et du sentiment d'efficacité personnel de l'acheteur sur le style de décision d'achat.
- **Evrard Y, Pras B., Roux E. et al. (1997),** Market : Etudes et Recherches en Marketing, 2è édition, NATHAN

Address for correspondence

Authors Mallek Anis - Institute of Sport and Physical Education of Sfax Tunisia

E-mail address mallekanis2011@hotmail.fr

THE EFFECT OF NUTRITION USING SATURATED AND UNSATURATED FATS ON ENDURANCE FOR ATHLETES APPLYING FOR CLUBS

Ali Talal Abdallah

Diyala University – Faculty of Physical Education

Abstract

Nutrition is one of the most important basics to ensure athlete's susceptibility and readiness to perform a physical effort, activity and production through which he can achieve good results to reach the hoped goals. In addition, the health status of the athlete is affected by food type and nature, so this requires concern with all details of food. It is known that nutrition with fats is one of the most important methods of providing players with energy especially in games which require physical effort and relatively longtime periods in this effort (aerobic games). Fats are used by the body in energy production through the aerobic physical effort, so the researcher made this study to identify the effect of having foods containing saturated and unsaturated fats on endurance level through identification of the maximum susceptibility of oxygen consumption.

The researcher selected a set of players divided into two empirical groups. A pre-test was made for both groups. Next, for a period of two weeks the first groups had foods containing great amounts of saturated fats in the form of animal fats, dairy derivations and others. The second group had foods containing great amounts of unsaturated fats in the form of foods containing vegetable oils, nuts and others for the same period of the first group. After that, post-tests were made for both groups.

After statistical treatments of testing results, results referred that the first group that used saturated fats showed an ability to perform physical effort and endurance possibility more than the second group which depended on unsaturated fats in nutrition. From these results, the researcher concluded that athletes who depend on foods containing saturated fats have more susceptibility to consume oxygen than athletes who depend on foods containing unsaturated fats. Accordingly, this is an indication to the player's ability to endure stamina during playing. The researcher also recommended that it is necessary for athletes to have nutrition according to the type of practiced activity and depend on foods containing saturated fats, especially when it comes to those who practice games characterized by long activity practicing periods.

Keywords: Athletes nutrition / saturated and unsaturated fats

1. INTRODUCTION & IMPORTANCE OF THE STUDY:

Fatty acids are one of the most important sources of energy that a body cannot generate, so they are required such as the linolic and linolenic acids. This can be done through foods containing these acids. Saturated fats are considered unhealthy foods especially in case of having great amounts of them compared with foods containing the same percentage of unsaturated fats, especially when one grows older and the physical effort level decreases. Saturated fats are found in meats and dairy products. As for unsaturated fats, they are found in vegetable oils, nuts and others.

Concerning athletes, having fats is very important with looking to physical effort exerted by athletes continually, especially in aerobic sports that depend on oxygen to produce energy. The body starts fats consumption when physical effort lasts for a relatively long period. Because there are no studies about the effect of having fats on an athlete's susceptibility to perform physical effort (stamina), any type of fats affecting more the increase in physical ability of endurance, the study conducted this empirical study on a sample of football players in Iraqi clubs through identifying maximum oxygen consumption limit (VO₂MAX), (1981,120-150 DAL MONTE,A). This is considered an indicator to the ability of aerobic endurance stamina. Maximum oxygen consumption is the maximum size of consumed oxygen in liters or milliliters in a minute VO₂. The maximum oxygen consumption limit is a term that is synonym to other terms such as the circulatory system, aerobic ability and endurance.

Length measurement is applied by measuring maximum oxygen consumption directly. This is done by giving a certain and graded effort each three minutes till the stage of exhaustion as gases are analyzed in exhaling and lung ventilation is counted. Using various methods, the amount of consumed oxygen is counted during exertion and it represents the susceptibility of the heart and blood vessels to provide oxygen to working muscles. Direct measurement is the most proper method to measure maximum oxygen consumption

susceptibility, but it requires complicated devices and technical abilities that are not found for teachers and trainers in addition to all types of devices. Therefore, most workers in physical education prefer using indirect methods including Copper Test that got the highest rate from experts (Guyton A. C. and Hall, 1996).

The study aims to determine the effect of having foods containing great amounts of fats on maximum oxygen consumption susceptibility (VO2 MAX) through the identification of types of fats (saturated and unsaturated fats). The researcher proposed that foods containing saturated fats have more susceptibility to consume oxygen than athletes who depend on foods containing unsaturated fats.

2. METHODOLOGY :

The researcher used the empirical method as it is proper for the nature of the study.

Sample of the Study:

The sample of football (30) players divided into (15) players for the first group and (15) players for the second group. The first group depended on saturated fats and the second group depended on unsaturated fats. The follow-up lasted for two weeks and identified the sample with some variables.

Table (1) Identification of the first and second sample:

Variables	Arithmetic Mean	Median	Standard Deviation	Skewness Coefficient
Length	176.83	177	6.23	0.56-
Weight	70.69	70	5.91	0.180
Training age	5.38	5	3.79	1.088
Time age	22.30	22	7.31	0.727

The study found that all values of skewness are found within the curve with the percentage of (± 3) which referred to identification of the study sample members in these indications in order to achieve accurate results based on correct scientific principles.

The Used Tests

- 1- Copper Test (walking and running for 12 minutes) to measure maximum oxygen consumption.

3. RESULTS AND DISCUSSION

Discussion of significance of differences for pre and post tests (first group)

Table (2) differences in means, deviations and the T-value of the maximum oxygen consumption. (first group)

treatments variables	Measuring unit	Mean	Deviation	T-counted value	T-scheduled value
Maximum oxygen consumption	Meter	170.4	8.94	4.92	1.14

From table (2) and measuring scheduled t-value under temperature degree (1-15) and significance level of (0.05), we found that it equals (1.14) which is less than its counted value (4.92) and this asserts the presence statistically significant differences for the sake of the post-test. This means that the nutrition program used by the first group depending on saturated fats had an effect on increasing functional ability of the body through increasing maximum oxygen consumption.

Table (3) differences in means, deviations and the T-value of the maximum oxygen consumption. (second group)

treatments variables	Measuring unit	Mean	Deviation	T-counted value	T-scheduled value
Maximum oxygen consumption	Meter	1.53	0.96	0.411	1.14

From table (3) and measuring scheduled t-value under temperature degree (1-15) and significance level of (0.05), we found that it equals (1.14) which is more than its counted value (0.411) and this asserts that there are no statistically significant differences for the sake of the post-test. This means that the nutrition program used by the first group depending on unsaturated fats did not have an effect on increasing functional ability of the body through increasing maximum oxygen consumption.

Discussion of Differences Significance for Pre and Post Tests (First and Second Group):

From table (2) it is clear that the arithmetic mean for differences in the first group was (170.4) and standard deviation was (8.94). During counting the t-value, it was (4.92) and this is more than comparing with the scheduled t-value (1.14). This shows that there are statistically significant differences and that the first group depended in its nutrition on saturated fats for two consecutive weeks and an average of two meals every day. This had an effect on increasing the body’s functional susceptibility through Table (2) differences in means, deviations and the T-value of the maximum oxygen consumption.

From table (2) and measuring scheduled t-value under temperature degree (1-15) and significance level of (0.05), we found that it equals (1.14) which is less than its counted value (4.92) and this asserts the presence statistically significant differences for the sake of the post-test. This means that the nutrition program used by the first group depending on saturated fats had an effect on increasing functional ability of the body through increasing maximum oxygen consumption (VO2MAX) through the approved test which is the Copper test to measure aerobic ability.

From table (3), it became clear that the arithmetic mean of differences is (1.53) and standard deviation of differences (0.96). During counting the counted t-value, they were (0.411) and compared with the scheduled value, it was (1.14) which is bigger than the counted t-value. This shows that there are no statistically significant differences. This also means that the second group that depended on unsaturated fats was not affected in increasing body functional susceptibility as there was not any increase in maximum oxygen consumption (VO2MAX) through the Copper test to measure aerobic ability.

The used nutritional program showed that athletes depended on saturated and unsaturated fats for two weeks was done to achieve accurate results. Through statistical results, the hypothesis of the study was achieved by statistically significant differences between first and second group in pre and post tests which showed that having saturated fats is better than having unsaturated fats in increasing the body’s functional susceptibility through increasing the athlete’s oxygen susceptibility as a functional indication and a good functional ability for the body.

4. CONCLUSIONS:

- 1- Nutrition for athletes with food containing great amounts of saturated fats contributes in increasing functional and physical susceptibility of players compared with foods with unsaturated fats.
- 2- Nutrition has a strong relation with physical production of athletes and according to the type of the used activity.
- 3- There are food similar in the amount of calories but differ in releasing speed and leakage from the body.

Recommendations:

The researcher made the following recommendations:

1. There should be dependence by athletes, especially aerobic game athletes, in foods containing a great amount of saturated fats, instead of unsaturated ones.
2. Nutrition using saturated fats shall be few days before competitions.

5. REFERENCES

- Abdelfattah, A. M. (2000): “Fitness Physiology”, Cairo, Dar Al Fikr Al Arabi Press.
- Guyton, C. A. & Hall, G. (1997): “Reference of Medical Physiology”, (Translated by Sadek Al Helaly), Beirut.
- Al Kenany, A. A. (2009): “Introduction to Statistics and SPSS Applications”, Baghdad, Dar Al Wathaek Wal Kotob Press.

- Abd Tarfi, A. S. (2013): "Applied Tests in Physical Education", Baghdad, Dar Al Wathaek Wal Kotob Press.
- Roshdy, M. A. (1997): "Sport Medicine in Health and Illness", Monshaat Al Maaref, Alexandria.
- Tarek, M. A. (2002): "Means and Methods of Scientific Research in Physical and Sport Education", Amman, Al Dar Al Elmia Aldawlia.
- Guyton A. C. and Hall, J. Textbook of Medical Physiology .9th Ed, W. B. Saunders company, Philadelphia ,1996
- DAL MONTE, A. " Exercise Testing and Ergometers" in The Olympic Book of Sports Medicine, Vol.1, ed. By A.Dirix, H.G. Knittgen & K. Tittle. Blackwell Scientific Publications, Oxford, 1981.

Address for correspondence

Ali Talal Adballah: *Diyala University – Faculty of Physical Education*

E-mail: alitalal162@yahoo.com

THE EFFECT OF PLYOMETRIC STRENGTH TRAINING ON DEVELOPING THE MOST IMPORTANT PHYSICAL ABILITIES, SPIKES PERFORMANCE AND BLOCKS FOR VOLLEYBALL JUNIOR PLAYERS

Feras Sohail Ibrahim

Babylon University – Faculty of Physical Education

Abstract

The volleyball game of sports that rely on the basic skills of offensive and defensive and special skill beating overwhelming and too defensive skills (bulwark), which had been a major development, making it harder than the possibility of scoring points easily and this is something which has given the importance of developing the skills of beating overwhelming and bulwark, and through the experience of the researcher being players for the game of volleyball and up to date most of the teams in the Elite League and even at the level of the team, noted the lack of attention to some of the coaches to prepare your physical exercises physical abilities associated with the performance skills of the junior volleyball, which negatively affects the performance of my skills (beating overwhelming and bulwark) and in turn, the lack of good results, so the researcher felt the use of force exercises to develop the most regressive own physical capacity and its impact on the accuracy and performance of the beating overwhelming bulwark junior volleyball. and target your search:

1 - Preparation of exercises to develop strength pummel the most important physical abilities of junior volleyball players.

2 - see the effect of strength training backlash in the evolution of the most important physical abilities and accuracy performance of the beating and crushing bulwark for beginners volleyball players. The researcher used the experimental design groups Almtkavitan with pre and post tests. And identifies research community my players back line in clubs Babylon l youth, who are (56) players were selected the same way the simple random totaling (30) players, and is then divided into two groups the first experimental rate (15) players, and the second officer and by (15) players also. The researcher conducting the experiment exploratory tests and then extract the scientific bases have been processing its data through the use of statistical methods appropriate ones (mean, standard deviation, test (t) for independent samples and symmetric, simple correlation coefficient). Was the most important conclusions are:

1 - The emergence of a positive impact in the evolution of the physical abilities and my skills for the beating overwhelming and bulwark of the experimental group and the control group.

2 - The emergence of a preference for the experimental group in the development of physical abilities for using strength exercises and pummel my skills and beating overwhelming bulwark

and all of the tests

Key words: power backlash, physical abilities

1. Introduction & Importance of the Study:

Scientific advance is one of the variables of our modern age as it includes all aspects of life including sports which interact with human sciences to prepare balanced individuals and to be helped reach high levels in sport events. To reach competitions, it requires a comprehensive series of rules based on scientific principles of athlete selection, education and training. Volleyball is considered one of the sports which gained considerable interest and progress through scientific and world efforts as well as the use of tests and measurements that help select players to prepare them in a proper way. In order to achieve progress on the junior level, we have to show the most important physical abilities which aim primarily to choose the best for sport practice. These elements are one of the

basic principles on which the skilled level of different sporting activities depend. Reaching high levels depends on physical and skill abilities to suit the type of practiced activity and facilitate success if trained on a correct scientific basis.

The researcher believes that plyometric strength training is one of the effective training techniques in developing physical and skill abilities as it is directed to abilities that need to be developed and have special performances, so physical abilities should be developed for these skills as they are required for athletes in order to cope with the match and perform what is needed till the match's last moments. The importance of the study lies in the use of plyometric strength training to develop the most important physical abilities and its effect on spikes accuracy and blocks for junior players. This is because it is one of the most decisive skills in a volleyball match and it is a difficult skill which requires a special skill to produce the best performance for trainers to achieve good results.

Problem of the Study:

Volleyball is one of the games that depend mainly on attacking and defense skills, especially spikes and defense skills (blocks) that were greatly developed. This made it difficult to score points and gave special importance to both skills. As an experienced volleyball teacher and follower of most teams in the tournament, the researcher noticed that some trainers do not give much importance to physical preparation of abilities related to volleyball skills. This has a negative effect on the performance of spikes and blocks which, in return, may not achieve good results. Therefore, the researcher chose using plyometric strength training to develop the most important physical abilities and their effect on spikes and blocks performance accuracy for volleyball junior players. The study aimed to prepare plyometric strength training to develop the most important physical abilities of volleyball junior players, determine the effect of plyometric strength training in developing their most important physical abilities.

2. Methodology:

The researcher used the empirical method by designing two equal groups with pre and post tests.

Community & Sample of the Study:

The community of the study is determined from (56) junior players of Babylon volleyball clubs (Al Kassem, Al Medhateya – Al Mahawel and Al Haashemeya) were chosen randomly. A sample of (30) players was chosen and divided into two groups: empirical group (15 players) and control group (15 players).

Fieldwork

Determining the Most Important Physical Abilities of Junior Volleyball Players

To determine the most important physical abilities of junior volleyball players, the researcher suggested a set of abilities in a questionnaire to be presented on (9) experts and specialists as follows:

Table (1): Relative importance and percentage of the most important physical abilities:

Serial	Physical ability	Relative importance	Percentage	Test result
1	Explosive ability	90	% 100	✓
2	Speed ability	90	% 100	✓
3	Endurance	80	%85.71	✓
4	Moving Speed	40	%50	X
5	Flexibility	43	% 54.2	X

Determining the Most Important Physical Abilities & Skills in Volleyball Understudy:

To determine the most important physical abilities, spikes and blocking skills of junior volleyball players, the researcher suggested a set of abilities in a questionnaire to be presented on (7) experts and specialists as follows:

Table (2): Relative importance and percentage of the most important physical abilities and skill tests:

Serial	Physical abilities, spikes & block tests	Relative importance	Percentage	Test result
1	Vertical jump of Sargent (feet)	70	% 100	✓

2	Static Long jump (feet)	38	% 54.2	X
1	Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	62	%88.57	✓
2	Arm bending and stretching on a prostration posture (10) for arms	34	% 48.5	X
1	Legs bending and stretching in 30 seconds	37	%52.85	X
2	Jumping forward test with legs together for the maximum distance in 30 seconds	70	% 100	✓
7	Testing diagonal spikes skill accuracy	38	% 54.2	X
8	Testing straight spikes skill accuracy	70	% 100	✓
9	Single block test	70	% 100	✓
10	Group block test	37	%52.85	X

Scientific Principles of Tests:

Validity:

Test validity is the test measure accurately and not measuring anything else. The researcher used content validity through testing a set of experts and specialists (annex 1).

Reliability:

Test reliability is the accuracy extent in measurement and consistency when applied multiple times on the same individuals. In order to extract reliability coefficient, the researcher used testing and retesting. Then, he extracted its counted and scheduled values at freedom degree (4) and significance level (0.05). Results showed that the counted value is bigger than scheduled one which refers that tests have a high degree of reliability as in table (3).

Objectivity:

Objectivity is opinion similarity of more than one referee when evaluating a test. In order to identify test objectivity, the researcher resorted to degrees of referees for test results during retesting. Simple correlation coefficient was counted between the first and second referees. Results showed that all tests are highly objective as in table (3):

Table (3): scientific principles (reliability coefficient, objectivity coefficient) of research tests:

Serial	Tests	reliability coefficient	objectivity coefficient
1	Vertical jump of Sargent (feet)	0.90	0.90
2	Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	0.87	0.91
3	Jumping forward test with legs together for the maximum distance in 30 seconds	0.89	0.90
4	Testing straight spikes skill accuracy	0.91	0.92
5	Single block test	0.84	0.88

Scheduled correlation coefficient value is (0.81)

Pre-Test:

The researcher made pre-tests for the study sample (30 players) at 4 pm on 10/12/2014 before starting the main experiment with setting all variables.

Sample Identification:

The researcher used the following statistical methods: arithmetic means, standard deviation, mode and skewness for variables of length, weight, age and training age for the real identification of the sample as in table (4) showing the sample is homogeneous.

Table (4): identification of the study sample's members:

Serial	Variables	Arithmetic mean	Standard deviation	Mode	Skewness
1	Length	182	3.42	175	0.69
2	Weight	78.30	4.26	76	0.80
3	Age	14.3	1.07	14	0.56
4	Training age	4.10	1.02	3	0.19

Comparing sample groups:

Each researcher has to form equal groups at least in terms of related variables of the study. The researcher used the following statistical methods: arithmetic means, standard deviation and the t-test for independent samples (between control and empirical groups) as in table (5):

Table (5): homogeneity of the study sample's members:

Serial	Tests	Control group		Empirical group		T value	Significance
		Mean	S.D	Mean	S.D		
1	Vertical jump of Sargent (feet)	310.33	5.37	308.68	5.11	0.13	Random
2	Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	5.45	0.84	5.38	0.93	1.44	Random
3	Jumping forward test with legs together for the maximum distance in 30 seconds	14.34	1.56	13.97	1.24	1.86	Random
4	Testing straight spikes skill accuracy	5.22	0.24	5.10	0.32	1.27	Random
5	Single block test	6.03	0.07	5.88	0.12	0.86	Random

Table (5) shows that the counted t-value of the study tests is less than its schedule value (2.04) at significance level (0.05) and under freedom degree (28) which achieves the principle of equalization in the study tests.

Training Method using Polymetric Strength Training:

A training program using various polymetric strength training for junior volleyball players for the empirical group only (15 players), the application of the method started on 14/12/2014 and lasted till 15/02/2015 for two months (8 weeks) in (3 units) weekly. Total training units number was (24 units). The researcher set 4 pm for training performance after 10-15 minutes warming up. The researcher considered ordering the exercises according to their difficulty gradually starting from jumping horizontal jumping to jump over heights over posts and boxes. As for arms, they included gradation with medical ball weights and due to sample performance. The period of exercises in the regular training unit in the club was (90) minutes. Exercises were integrated in the main division (50 minutes) for the empirical group, while the control group lasted with the trainer's regular method.

Post-Tests:

After finishing the training program using polymetric strength training on the empirical group, post-tests were made in close conditions to pre-tests performed with direct supervision of the researcher.

Results, Analysis and Discussion

Table (6) The following are results of arithmetic means, standard deviations, counted and scheduled t-value for the empirical group tests:

Statistical features Tests	Measuring unit	Pre-test		Post-test		T-value	Significance
		Mean	S.D	Mean	S.D		
Vertical jump of Sargent (feet)	Watt	310.33	5.37	317.47	4.72	3.24	Significant

Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	Cm	5.45	0.84	5.85	0.75	3.16	Significant
Jumping forward test with legs together for the maximum distance in 30 seconds	Cm	14.34	1.56	16.53	1.24	3.65	Significant
Testing straight spikes skill accuracy	Degree	5.22	0.24	6.45	0.63	2.67	Significant
Single block test	Degree	6.03	0.07	7.31	0.92	3.29	Significant

The scheduled t-value = (2.14) at significance level (0.05) and under freedom degree (14)

Results of Physical Abilities, Spikes and Blocks for the Empirical Group in Pre and post tests:

Table (7): The following are results of arithmetic means, standard deviations, counted and counted t-value for the empirical group pre and post tests:

Statistical features Tests	Measuring unit	Pre-test		Post-test		T-value	Significance
		Mean	S.D	Mean	S.D		
Vertical jump of Sargent (feet)	Watt	308.68	5.11	338.44	4.69	3.69	Significant
Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	Cm	5.38	0.93	6.43	1.10	4.84	Significant
Jumping forward test with legs together for the maximum distance in 30 seconds	Cm	13.97	1.24	17.85	1.37	4.83	Significant
Testing straight spikes skill accuracy	Degree	5.10	0.32	8.33	1.22	5.15	Significant
Single block test	Degree	5.88	0.12	8.68	1.41	4.33	Significant

The scheduled t-value = (2.14) at significance level (0.05) and under freedom degree (14)

Results of Physical Abilities, Spikes and Blocks for the Empirical Group in Post tests:

Table (8): The following are results of arithmetic means, standard deviations, counted and counted t-value for the empirical and control group's post tests:

Statistical features Tests	Measuring unit	Pre-test		Post-test		T-value	Significance
		Mean	S.D	Mean	S.D		
Vertical jump of Sargent (feet)	Watt	317.47	4.72	338.44	4.69	5.19	Significant
Overhead hand Throwing of a (2kg) medical ball on a seated position on a chair (arms)	Cm	5.85	0.75	6.43	1.10	4.17	Significant
Jumping forward test with legs together for the maximum distance in 30 seconds	Cm	16.53	1.24	17.85	1.37	4.59	Significant
Testing straight spikes skill accuracy	Degree	6.45	0.63	8.33	1.22	4.77	Significant
Single block test	Degree	7.31	0.92	8.68	1.41	5.47	Significant

The scheduled t-value = (2.04) at significance level (0.05) and under freedom degree (28)

3. Results Discussion:

From previous presentation and analysis of tables, it becomes clear that there is a development in physical abilities, spikes and block skills for empirical and control groups as a result of the regular program ser by the trainer in addition to regular training of players

which played a significant role in this development. Saad Mohsen asserts that expert' opinions, whatever their scientific background, inevitably lead to achievement and they are based on a scientific base in training organization, programming, the use of suitable and graded intensity and observing individual differences. In addition, the researcher used optimal frequencies and suitable break periods under the supervision of specialized trainers and in good training conditions concerning time, place and tools. The researcher thinks that the reason for the great progress in the empirical group's performance in physical abilities, spikes and block skills for junior volleyball players lies in polymetric strength training which contributed to develop special abilities and the set of physical abilities affecting movement performance with their active influence. This was reinforced by Talha Hossameldin, 1997 when he said that polymetric strength training work positively on enhancing flexible power and movement affecting the explosive strength greatly through muscle fiber extension and extraction. This also affects quick response of muscles as a reflex by muscles. When linking explosive ability training with skills performance, the development of explosive ability is among important physical abilities in developing volleyball skills as this game needs great power for the purpose of spike shoot and blocks. It also needs strong movement and transitional speed and changing direction and rotating which was asserted by Steven, 2000 as he said that movement speed is a result of quick explosive strength and used as a main function in skill performance based on transitional, movement speed, lightness and changing direction that affects explosive stoppage. Bastawesy Ahmed, 1999 stresses that the importance of polymetric strength training is that they work side by side with good technique developing the level of achievement in various sports. This is clear scientific evidence on the connection of polymetric strength training and their participation to develop skill performance of players. The researcher believes that explosive strength is one of the major abilities that require vertical jumping and the increase in this jump happens due to the development of explosive strength. Moreover, Pollock, 1990 says that explosive ability comes at first among physical abilities in most sport activities that require vertical jumping.

4. Conclusions:

- 1- There is a positive effect of developing physical abilities, spikes and blocking skills in both empirical and control groups.
- 2- The empirical group is better in developing physical abilities using polymetric strength training, spikes and blocking for all tests.
- 3- Choosing polymetric strength training to develop physical abilities was proper to operating muscles of spikes and blocking which had an effective result on developing performance.

5. Recommendations:

- 1- It is necessary to assert the use of plyometric strength training to contribute to develop physical and skill abilities of junior volleyball players.
- 2- Plyometric strength training are similar to skill performance in terms of movement performance, directing strength and muscles operating these volleyball skills.
- 3- Making attempts to use plyometric strength training on other skills in handball or basketball as they are proper to players' levels, susceptibility and due to their categories.

6. References

- Athir Mohammed Sabri: Training regressive force, Academy Sports Iraqi, 2011.
- Bstois Ahmed; foundations and theories of sports training, Cairo, Dar Alfekr Al Arabi ,1999.
- Bomba: Albleomterc training to develop maximum power, i 1, translation), Jamal Sabri Faraj), Amman: Dar Tigris 0.2010.
- Saad Mohsin Ismail. The impact of training methods for the development of the explosive power of men and arms in the distant correction accuracy jumping high in handball. PhD thesis. Baghdad: 1996.
- Jamil Qasim Ahmed Khamis: Encyclopedia of World Handball, Baghdad, Serenity Foundation Publications, 2011.
- Zia Khayat and Mohammed Nofal Hayali. Handball. Mosul: National Library for printing and publishing, 2001.
- Talhh Husamuddin: Scientific Encyclopedia training in power - the ability - bearing strength - Flexibility: Cairo, book publishing center, 1997.
- Mohammed Tawfiq Aloulila. Handball (learning - training - Technique). I 1. Kuwait: Press the peace,1989.
- Mohammed Jassim al-Yasiri and Marwan Abdul Majeed: - Measurement and Evaluation in Physical Education and Sports, i 1, Oman, Warraq Foundation Publishing and Distribution, 2003.
- Mohammad Sami Melhem: - Measurement and Evaluation in Education and Psychology, i 1, Oman, Dar facilitator for publication, 2000.
- Marwan Abdul Majeed: - scientific principles and methods of statistical tests and Measurement in Physical Education, i 1, Oman, Dar Al Arab Thought 0.1999.
- Munir Zarzis Ibrahim. Handball comprehensive training for all skill and excellence. Cairo: Dar Al Arab Thought, 2004.
- Nabil Kazem Raed Abdul Amir: the psychology of handball, Oman, Dardjhl for printing and publishing, 2014.
- Hohmannes:limpers verlag Gmbh wiebelsheimK2007.

- Pollock, M. L And Wilmore J. H ; Exercise In Health And Disease , W.B., Saunders, Philadelphia , 1990.
- Steven, Scott Plisk, Training For Speed, Agility And Quickens, Human Kentics, 2000.

Address for correspondence

Authors : Feras Sohail Ibrahim . Babylon University – Faculty of Physical Education

E-mail address : Firasmrt@gmail.com

THE EFFECT OF THE DISABLING FORCE USING PARACHUTE IN DEVELOPING THE FAST AND EXPLOSIVE FORCE IN TERMS OF THE INSTANT PUSH TOWARDS THE TWO STAGES OF THE APPROACH AND THE UPGRADE TO THE LONG JUMP FOR YOUTH

Raja Abdul Kareem Hameed

University of Diyala/ College of Physical Education

Abstract

The researcher moves towards delineating one of the assisting training tools which is the new training method through parachutes, using them as resistant force in an airy medium via drag force benefiting from the mechanical laws in determining training hardness of long jump players through controlling the umbrella surface that is exposed to air and the player's body speed. This resistance, then, will lead to a burden on working muscles which will heighten the level of explosive and speedy power which will be reflected on the level of achievement. It will also lead to link between steps of closeness and rising without a decrease in in speed, and, here lies the significance of the study. Therefore, in order to have an improvement in the level of special bodily abilities by using assisting tools so as to achieve integration in bodily abilities and performance especially in the final step and rising to gain good accomplishment.

The researcher made use of the experimental approach of the one experimental group design due to its appropriateness to the nature of the study. Sample of the study is deliberately selected, comprising of (5) players in Diyala high jump under 20 years team 2014-2015. Moreover, the study field procedures included photography, tests and measurements used in the research. Photography is included in the physical tests which comprised speedy and explosive power. These trainings are applied within the main part of the training unit, lasting from 45 to 50 minutes, 3 units per week for a period of 8 weeks, with a total of 24 training units. The load is gradually increased each two weeks as trainings were repeated each two weeks. The load is gradually increased in the other two weeks and so on. For the sake of having an effective and influential training based on scientific bases, the researcher adopted the frequent training method, then resting duration is specified to be the ratio between effort time and rest time. The study concluded that using force according to drag force law via parachutes (as training tool) has positively influenced the development of speedy and explosive powers of the study sample.

Keywords: Parachute

1. INTRODUCTION

Using the assistive devices in implementing the special training which are accompanied with improving force has become a necessary matter. As setting the exercises according to these devices help in perfecting the performance and integrating the muscle strength, and it will be the main condition of the force related to the exercises of the performance stages influence.

Each sporting efficiency needs the athletic to have levels of physical, motor and physiological abilities rather than its mechanical conditions. The training approach and training methods according to the requirements of the sporting efficiencies in developing the most important physical and mechanical abilities during the different training stages have a role in evaluating the sports performance and revealing the strengths and weakness in the performance in order to enable finding out the errors in the movement and avoiding reasons thus achieving compatibility for reaching the target fully as possible.

The target of using the aids in the training is developing the physical abilities and the technical performance related to the correct mechanic conditions for developing the achievement for the different sports games as the training methods and the directions are different for the players of athletics especially the speed activities. The trainers and the researchers are looking for the best of what is serving the education process and increasing the numbers' development. Developing physical abilities per each sports skill should be done according to scientific basics related to the training of any skill.

The researcher has turned to one of the helpful training methods which is the new training method by Parachute and used it as a resistant force in an air milieu through the law of the disabling force and benefiting from the mechanic forces in determining the training intensity for the long jump players by controlling the surface of the Parachute which is displayed for air and the speed of the player's body. The resistance will lead to occur a burden on the working muscle. This leads to upgrade the level of the fast and explosive force which is reflected on the level of achievement (Al-Fadli: 288, 2010) as this method provides the chance for the player for taking the appropriate mode in his body's joints rather than the suitable slop angle . as well as it leads to the efficiency of the working muscles, its development, its results from developing the fast and explosive force which may lead to connect between the

approach and the upgrade steps without any decrease of speed. Thus the importance of the search lies on it, because of what the long jump competition suffers from lowering its levels in Iraq comparing to the regional, Arabic and international levels. We should search for all the new in the training terms and benefit from all the existing environmental conditions for coping these levels and harnessing it for developing the different sporting achievements including the long jump competition. So exploiting the environmental conditions in this field is considered one of the methods which can contribute to solve the problem of lowering the Iraqi number in the long jump competition. The long jump is one of the related competitions related to the mechanic conditions. So this study has conducted for finding some solutions which contribute to develop the physical abilities using the helping methods in order to achieve the integration in the physical abilities and the performance if there is a progress in the level of the physical abilities related to the technical performance especially during the last step and the upgrading thus achieving the good achievement. The targets of this research includes knowing the level of the fast and explosive force in term of the instant push of the search population and setting the exercises of the enabling force using Parachute for the research sample thus knowing the effect of these trainings in developing the fast and explosive force in terms of the instant push.

The research methodology: the researcher used the experimental approach in designing the experimental group in order to be fit with the research nature.

The research sample: the research sample is chosen in the intended deliberated way which includes about 5 players in the team of Dilleya club for youth long jump by finding the moderate mode for the research sample in terms length, age and mass using the twist factor. (± 3) indicates that there is an analogy between the sample's populations as indicated in table 2.

Table 1 shows the mathematical mean, the standard deviation, the catalyst and the twist coefficient for the variables of search sample, which are (the length, the age and the mass.

The harmony element	The Mean	The deviation	The catalyst	The twist coefficient ± 3
The length (m)	1.82	0.7	1.84	.85
The age (year)	92.7	0.09	93	.10 -
The mass (Kgm)	26.75	3.15	26	.71

The training tool, which is used in the research (Parachute)

One of the helping training methods which is used by the researcher is the Parachute. The researcher has used Parachutes in two different mass according to the international measures used in training the athletics which are set forth in the results of the researches and the studies in this regard. As the used Parachute was in the square shape composed from eight related pieces to form the final use Parachute. Its cloth's kind was Water proof. Its design was similar to the pilots Parachutes as much as possible because the measures of the first Parachute was 0.72 m² as the following: the circumference 6m, the length of each side is 1.5 m and deep of 1.15. the true length of the rope which tides the player and the deep point of the Parachute is 2.15m. while the second Parachute is in the mass of 0.48 m² as its circumference 5.20 m which means that the length of each side is 1.30 m with a depth of 90 cm. the rope length which tides the player and the Parachute depth was like the last measure 2.15 m. this Parachute is tied with an interlaced cloth which is Retractable and fixed on the external side per each Retractable eight interlaced pieces. These all eight pieces are collected in one point from it the rope is came out. This rope connects the player with the middle of the belt. The player fixes the belt above the waist. The Retractable is pulled after passing the required distances in the training.



Figure no.1 shows the training method

2. THE PROCEDURES OF THE FIELD RESEARCH:

The procedures of the photographing, the tests and the used measures in the research. The photographing procedures are included in the physical tests as it used a camera and it is fixed on the side vertically by the player. And in measuring the achieving distances in the tests. The camera is put in the middle of the player's movement during the performance. It will be at a distance of 4.65m and a height of 1.35m from the middle of the camera focus to the ground. The aim of the photographing for the physical tests is measuring the exerted force according to Newton's second act:

Force= mass × speedup. In the cases of pushing the jump vertically of the stability. The law will be in the following formula:

$$\text{Force} = (\text{mass} \times \text{speed}) / \text{time}$$

Through the height code= $(\text{speed up} \times \text{time}) / 2$. We get the flight time which means that:

$$\text{Speed} = \sqrt{2 \times \text{height} \times 9.8}$$

$$\text{The speed up} = \frac{2 \times 1}{\text{time}}$$

Y flight

By the video analysis, we get the instant pushing time, then we measure the body's mass and abstract the instant force from the force code= $(\text{the mass} \times \text{the speed}) / \text{the time}$. While measuring the instant force in the long jump is horizontal. So the steps as in the vertical jump of stability except that the speed measurement is in the following code:

$$\text{The speed} = \sqrt{\text{the distance} \times 9.8}$$

Like what is concerned measuring the speed fast as in testing the sequential jump so the force could be measured too according to the second law of Newton:

$$\text{Force} = \text{mass} \times (x_2 - x_1) \div (y_2 - y_1)$$

The researcher after ending the analysis of the videos according to the program of the kinetic analysis (Kinovea) for extracting all the variables according to the mechanical codes and extracting the variables related to the performance and the tests. The physical tests include the following:

The test of the speed which is distinctive by the speed: the five test, the stability of the high speed and its measurement (Sareh El-Fadly: 2012)

The explosive force test of the feet: testing the long jump stability (Sareh El-Fadly: 2012)

The pretests:

The researcher has conducted the pretests on 20/10/2014. On this basis, the special trainings are set.

The training approach:

After seeing the sources and the opinions of the experts and specialized about the training approach situation. The researcher has set the training approach using Parachute in order to show its impact in developing the fast and explosive force in the terms of the instant pushing of the long jump for youth.

- the set training approach started on 15/11/2014. It is ended on 15/1/2015.

The training intensity was determined according to the parachute's surface and speed by which they are trained according to the law of air obstruction as the following:

The force of air obstruction= 1/2 of the air intensity X the obstruction constant X the body's surface X the square of speed.

When the air intensity and the obstruction constant are constant numbers, the researcher resorted to control the parachute surface and the sprinter's speed in order to determine the training intensity when using parachute as the following:

If the Parachute's surface was 0.72 m². when we suppose 50 m as a distance for running in the maximum speed using this parachute after the achievement time (100%) of this parachute, this parachute could be fixed and controlled by determining the intensity of the required training according to the maximum required time for this distance. For example:

If the achievement maximum time for passing the distance of 50 m with a parachute with a tabular of 0.48 m² is 9 seconds, the training frequency using this parachute and intensity of 90% and a frequency of 6 times is 10 seconds.

Which means that 9 seconds/ 0.90= 10 the required intensity.

As the training 50 m X 6 could be in 10 seconds using the parachute 0.48 m².

If we need to pass the same distance for a Parachute with a larger tabular, the resistance will be increased and it requires from the athletic to exert more effort in order to achieve 10 seconds for passing a distance of 50 m. thus the training is determined accordingly.

These trainings are applied within the main department of the training unit. It took from 45- 50 minutes in a reality of 3 times a week for 8 weeks. The number of the training units was about 24 unit then progressing upwards by the training load gradually after two weeks if the trainings are repeated every two weeks. The training load is increased gradually in the last weeks and so on. The researcher adopts the frequency training method for being the training effective depending on the scientific basics. The comfort period is determined from the percentage between the voltage's period to the comfort's period.

The distance tests: the distance tests are conducted on 25/1/2015

3. THE RESULTS DISPLAY, ANALYSIS AND DISCUSSION:

The display, analysis and the discussion of the variables results of the explosive fast force test of the two legs:

Table 2 shows the mathematical means, the standards deviations, and the differences of the pretests and Posty tests of the physical variables

		The pretests		The posty tests		D	D			
		X	Y	X	Y					
The explosive force	Newton	905	161.92	1116	161.87	211	29.63	7.121	0.001	Significant
The fast force	Newton	2036	109.36	2290	157.15	254	69.589	3.650	0.000	significant

Table2 shows that the Tcalculated value for the search sample was under the error level less than 0.05 and the free degree of 4 in the fast and explosive force of the feet indicating the significance differences for the sake of the posty tests.

The researcher due the cause of this development to the training nature which is applied for the search sample which implies special training that aimed to develop the force of the muscular groups of the long jump especially for the lower limbs giving an indication to develop the technical performance control in the performance stages.

The trainings that applied during the training approach aims to develop the ability of the proportional muscles through its exposure to the training burden and its continuity to extract this force as soon as possible. The time force is limited. (the greater the muscular force to overcome the components, the greater is the speed) (Hamadi: 162, 1988)

The existence of the significant differences in the pretests and posty tests in the physical variables indicates that the used trainings of ability was effective in getting this result. As the training which used Parachute helps to increase the amount of the muscular ability of the search sample. (Gamal Sabri: 31, 2008) thinks that, "the force increase in the feet muscles by the resistance training leads to the feet's speed thus the increase of the muscular force is important for the athletic activities depending on the muscular ability.

The researcher thinks that the development in the level of the fast speed was effective and clear in developing the achievement. (Kamal Al-Rabdy: 42, 2004) points to the ability of developing the fast force through giving similar trainings to the required performance in the competitions but the effort's frequency should be little.

Some researchers has pointed to that the development in the explosive force as one of the most important abilities of developing the skillful techniques that should be developed as confirmed by (Abo El-Ella: 1997, 113) as the ability has a special importance in perfecting the skillful performance during the competition and the skill's acquisition.

(Al-Beik: 117, 1992) thinks that the force amount is less than the maximum amount and also the speed amount was less the maximum one though it is very high as the force is characterized by the speed represented by the frequency without waiting for a while in order to collect force like the rapid running.

It indicates that the applying vocabulary which the researcher adopts in determining the tools which contributes to develop the required physical performance work as a result of the dependence on determining Parachute during performing exercises. The area and the difference of the linked parachute area of the player works on motivating the largest amount of the muscular groups related to the performance and passing the jogging distances which are adopted in the training which the researcher is applied on the search sample. Organizing these trainings according to the disability law which the researcher adopts contributed greatly to develop and reduce the time of passing the test area adopted from the researcher thus it reflects on the players' performance in the pretests conducted by the researcher.

(Al-Fadly: 223, 2007) has pointed to that the importance of this training kind contributed to develop the muscles force in the movements of the spring and bending in the feet which depends in the performance of the jogging movements on highlighting the force in order to access the body a limited distance with the least possible time. It indicates the development of all the muscles within the kinetic springs related to the performance which depends on highlighting force during the spring of the joints which are responsible for movement. It gives a concept of the development of the sample's fast explosive force through the long passed distance by short instant pushes. The majority of the methods of developing the force is resulted from the training depends on the training of the constriction by the muscular lengthening and shortening whether it was for the knees or the legs especially with the youth and the beginners. It gives a clear difference in the level of the muscular force.

The researcher thinks that the force development and its fast explosive force development using this trainings has an importance of the long jump players. (Block: 60, 1990) confirms that the explosive force occupies the first rank between the order of the physical abilities in most of the athletic activities. It was confirmed by (Hasaneen: 1998, 22) as this ability has a special importance in its role in the skill performance during the competition and acknowledging the competition.

4. THE CONCLUSIONS

- 1- using the intensity according to the disability force act using Parachute (as a training method) has a positive impact on developing the explosive fast force for the research sample.
- 2- the trainings which are applied on the research sample leads to develop the fast explosive force values of the legs.
- 3- suing parachute leads to develop the achievement level.

5. RESOURCES:

- Hamadi, Mofiti Ibrahim, the atheletic training: (Cairo, Dar el-Maaref 1988).
- _ Al-Beek, Ali has established the numbers of the football palyers and the mass games. Cairo, Dar El-Fekr El-Arabi 1992.
- Al-Fadli, Sareh Abd El-kereem, the kinetic analysis Encyclopedia, the anatomical analysis and its mechanical and kinetic applications. Baghdad, AL-Okely press, 2007.

- Al-Fadli, Sareeh Abd El-Kereem, the measurements of force and fast explosive abilities according to the variables of mass, speed and measuring the force: (a research in the international scientific conference which is the first for youth and the eighth for the physical fitness colleges, Al-Mousel university, the physical fitness education, 2012).

Hasaneen, Mohamed Sobhy, ahmed Kasry Maaly, the applying athletic training encyclopedia. P1: Cairo, the book center for publishing, 1998.

- Abd El-Fatah, Abo El-Ela, the athletic training and the physiological basics, P1: (Dar El-Fekr El-Arabi, Cairo, 1997).

-" Bollok. M.L and Wilmore J.11: Exeercise in health and disease, (W.B) saundersphilodephia, 1990.

6. APPENDIX

Training module

The week	The unit	The distance	The intensity	The frequency	The comfort between the frequency	The groups	The comfort between the groups
The first	The first	50 m	80%	5	3:1	4	3.2
		80 m	85%	4	3:1	4	3.2
		120 m	85%	4	3:1	3	3.2
		80 m	80%	5	3:1	4	3.2
	The third	150 m	85%	4	3:1	3	3.2
		120 m	90%	4	3:1	4	3.2

Address for correspondence

Authors : Raja' Abdul Kareem Hameed - University of Diyala/ College of Physical Education

E-mail address : Rajae74@yahoo.com

THE EFFECT OF USING A PROPOSED TOOL IN ENHANCING PERFORMANCE & ACHIEVEMENT LEVELS DUE TO SOME BIO-KINEMATIC VARIABLES OF THE JAVELIN THROW

Ebtesam Haidar Baktash* Mahmoud Abbas Abdelhassan**

*Tikrit University, Faculty of Physical Education

**Al Qalam College, University, Physical Education Dept.

Abstract

The current study aims to identify the effect of the proposed tool in enhancing performance and achievement levels due to some bio-kinematic variables of javelin throw. Both researchers suggested that there is a positive effect of using the proposed tool on performance and achievement levels in javelin throw for the sake of the empirical group as they used the empirical method because it fits the nature of the study. The sample of the study was chosen from the first year students in the academic year 2012 – 2013. They were 24 students divided into two equal groups (12 students each). The researchers designed a proposed tool to learn and train javelin throw on 15 educational units starting from the first introductory unit till the last unit in two units per week. Data were statistically processed using arithmetic means, standard deviations and the T-tests for related and equal samples. As for conclusions, the study showed a clear positive effect in enhancing and developing some angles of the body especially body inclination angle and launcher angle. This was shown from results of mechanical analysis of javelin throw skill which, in turn, was reflected in developing achievement.

Keywords: Effect of the proposed tool, enhancing performance and achievement levels, developing some bio-kinematic variables, javelin throw.

1. INTRODUCTION & IMPORTANCE OF THE STUDY

The use of helping methods and tools in learning and training adds many experiences to learners with a high degree of performance mastering. Achieving high achievements in many sports is the goal which all athletes seek. To achieve this goal there should be a use of various types of methods and tools for athletes to depend on during learning various basic skills. Therefore, bio-kinematics is one of the sport sciences which contributed to great progress and development in sports in general and track and field games in particular represented in the study of reasons of movements and describing it using kinetic analysis depending on modern scientific appliances and methods to reach high achievement in various sport events.

The javelin throw is characterized by complex and hard performance as it is affected by a lot of aspects such as high fitness in terms of speed, flexibility and mechanical variables inside different parts of the body (arms, legs and trunks). Hence, the researchers resorted to use a proposed tool for athletes to depend on during learning kinetic performance. It is a scientific attempt to discuss scientific and training alternatives and methods related to kinetic performance. Therefore, this study is important in determining the effect of exercise using the proposed tool as a helping means in enhancing and developing performance and achievement levels for the first year students as well as accurate description of movement and showing its strength and weak points to raise the level of kinetic performance level in javelin throw.

Problem of the Study

Through the experience of both researchers in learning and training in track and field games, they noticed that students find difficulties in learning and mastering kinetic performance of javelin throw as it requires accurate and complex consistency of all body movements as well as angles of performance which causes an increase in time and effort during learning this game. Despite the presence of good educational and training courses, it is restricted to use modern appliances and tools as they have an effective role in providing teachers with important and accurate information about details of the skill, motivations and modification of kinetic behavior. Here, comes the problem of the study in identifying how effective this tool is in helping enhance performance and achievement levels in javelin throw. This, in turn, leads learners to be economic in the needed time and effort for quick learning due to some mechanical variables of performance and achievement levels.

Objectives of the Study

- Identifying how effective the proposed tool is in enhancing and developing performance and achievement levels due to some bio-kinematic variables in javelin throw.
- Identifying differences in pre and post tests in performance and achievement levels due to some bio-kinematic variables in javelin throw.
- Identifying differences in post-test in performance and achievement levels due to some bio-kinematic variables in javelin throw.

2. METHODOLOGY

Both researchers used the comparative empirical method as it is proper to the nature of the study.

Community and Sample of the Study

Community of the study consists of first year students for the academic year 2012 – 2013 in the Faculty of Physical Education – Tikrit University. The sample (13 students) was chosen randomly from section (C). After eliminating 7 students (4 in the exploratory experiment, 2 failures and one injury), the total number of respondents became 24 students divided into two control and empirical groups (12 students for each group). The researchers took into account samples should be similar and equal in variables of the study.

Identification of Groups of the Study:

To ensure identification and similarity of the sample, the researchers used the T- value in some variables of the study.

Table (1) shows arithmetic means, standard deviations and the (T) value for the variables of the study:

Tests	Measure unit	Control group		Empirical group		T counted value	T table value	Significance level
		Mean	S.D	Mean	S.D			
Age	Year	20.75	1.28	20.66	1.15	0.17		insignificant
Length	Cm	173.83	6.47	176.25	4.39	1.02		insignificant
Weight	Kg	71.25	7.26	72.00	4.69	0.28		insignificant
Approach speed	m/s	2.98	0.59	2.85	0.48	0.59		insignificant
Body inclination angle	Degree	6.42	0.81	6.20	0.65	0.70		insignificant
Launcher angle	Degree	28.16	1.93	27.08	4.52	0.77		insignificant
Achievement	m/cm	24.03	2.16	23.10	2.77	0.88		insignificant

The Proposed Tool:

Before starting designing the tool, the idea was discussed by the researchers and some experts and specialists in the field of kinetic learning and sport training to benefit from their scientific notes about the project. Both researchers created a clear and studied idea based on scientific principles in addition to saving time and effort for student teachers.

Components of the Proposed Tool:

The Head – a round circle (radius 1.50 m) including (5 cm) fixed with a handle and (30 cm) to be put in the middle post.

The Body – middle post (diameter 7 inch and 2 m tall) on which the bottom base of the tool is fixed with divided degrees to enable control raising and lowering the circle (slight) meaning that there is a shaft inside a shaft (the least diameter).

The Base – the bottom base of the tool is an iron triangular base consisting of three iron posts (diameter 5 cm and 50 cm tall) to keep the consolidation and balance of the tool with fixing the middle post inside the shaft.

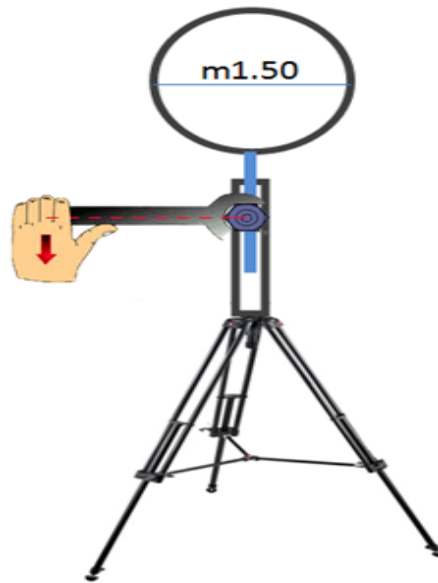


Figure (1): components of the suggested tool

How to operate the tool

- The student stands in front of the tool on a suitable and different distances, and then he throws the javelin inside the circle from a stationary position then gradual movement and throwing.

Purpose of the tool

- Saving time and effort in learning and training
- Taking correct positions for the throwing arm of the javelin concerning throwing angle
- Through raising and lowering the circle, approaching and moving away the tool from the student, he will be able to master the movement path of throwing

Field procedures of the study

Pre-Tests

After giving (3) introductory units for the sample member to explain, showing stages of performing javelin throw and legal aspects, the researchers performed the pre-test on 12/03/2013, corresponding Tuesday, by giving (3) attempts to each student and counting the best of them using legal javelins (8000 gm) recording the throwing distance for each attempt as well as video recording.

Main Trial

To start procedures of the study, the researchers followed the following steps:

- Applying the main trial using educational and training units represented in explaining technical performance of javelin throw, using detailed pictures and displaying some educational films as a helping means in education for both control and empirical groups.
- Applying educational units from 03/03/2013 (15 units) from the first introductory unit till the last unit on 21/04/2013.
- The empirical group used the proposed tool in learning and training, while the control group used the traditional method used by teachers of the subject.
- Applying two educational units in the week (Sunday and Tuesday) in duration of 90 minutes. Units were divided into (preparation section, main section and final section).
- The researchers used some special exercises that serve the performance and some appliances and tools such as medical balls and javelins with different weights (600 gm and 700 gm).
- The researchers determined some bio-kinematic variables that will subject to analysis by returning to some scientific sources as well as the experience of both researchers being coaches of track and field games.

The measured kinematic variables:

After reviewing sources and studies related to javelin throw, the researchers found that the most important kinematic variables that can be used as guides in evaluating technical performance are:

- Approaching speed

- Body inclination angle
- Launcher angel
- Numerical achievement

How to Measure the Study's Kinematic Variables

- Measuring approaching speed (the last two steps) by step length and duration.
- Measuring body inclination angle (the angle between the body's longitudinal axis and the vertical line at the moment of touching the forefoot the ground) by the two sides of the angle.

Launcher Angle: it is the angle between the total launching speed and the horizontal line.

- Numerical achievement: throwing distance for each successful attempt was counted by measuring (m/cm)

Post-test

After completing educational and training units of javelin throw, (15 units), post-test (for technical performance and achievement) was performed on the control and empirical groups on 23/04/2013, Tuesday, giving three legal attempts for each student and counting the vest of them.

Video Recording

The best way to get information is analysis via video recording through which movement, its paths and mechanical variables are studied. The researchers used video recording to describe and analyze movement by fixing the camera on a big three-side holder on a distance of 1 m, height of 1.30 m and frequency speed of (60 images/s). This process was performed in the place dedicated to javelin throw field to get data about mechanical variables of javelin throw, and then studying and analyzing them to achieve goals of the study.

Kinetic Analysis

1. After ensuring video recording procedure and clear resolution of images, the best attempt concerning achievement distance performance will be analyzed scientifically by using Kinovea program for kinetic analysis. This program is characterized by kinetic paths although it needs quick cameras as in the figure.



Figure (2): Front of the Kinovea program for kinetic analysis

3. RESULTS, DISCUSSION AND ANALYSIS

Results of pre and post tests for the control and empirical groups:

Table (2): arithmetic means, standard deviations and T- value for variables of the study for the empirical group:

Statistics Variables	Measure unit	Pre-test		Post-test		T counted value	T Table value	Significance level
		Mean	S.D	Mean	S.D			
Approach speed	m/s	2.85	0.48	4.63	0.40	8.53		Insignificant
Body inclination angle	Degree	6.20	0.65	9.33	0.52	9.80		Insignificant
Launcher angle	Degree	27.08	4.52	34.58	0.88	12.51		Insignificant
Achievement	m/cm	23.10	2.77	40.99	2.07	17.66		Insignificant

Table (3): arithmetic means, standard deviations and T- value for variables of the study for the control group:

Statistics Variables	Measure unit	Pre-test		Post-test		T counted value	T Table value	Significance level
		Mean	S.D	Mean	S.D			
Approach speed	m/s	2.98	0.59	3.26	0.54	4.13		Insignificant
Body inclination angle	Degree	6.42	0.81	9.43	0.42	12.46		Insignificant
Launcher angle	Degree	28.16	1.93	42.93	2.49	16.90		Insignificant
Achievement	m/cm	24.03	2.16	34.75	2.62	3.55		Insignificant

Significance level: (0.05) and freedom degree: (11)

Results of post-tests of empirical and control groups:

Table (4): arithmetic means, standard deviations and T- value for post-tests for the control and empirical groups:

Statistics Variables	Measure unit	Pre-test		Post-test		T counted value	T Table value	Significance level
		Mean	S.D	Mean	S.D			
Approach speed	m/s	3.26	0.54	4.63	0.40	6.85		Insignificant
Body inclination angle	Degree	9.43	0.42	9.33	0.52	0.71		Insignificant
Launcher angle	Degree	42.93	2.49	34.58	0.88	4.66		Insignificant
Achievement	m/cm	34.75	2.62	40.99	2.07	6.20		Insignificant

4. RESULTS DISCUSSION

Discussing results of post-tests for the control and empirical groups

Tables (2, 3) show that the counted T value was higher than T table value (3.44) in all variables of the study and in control and empirical groups. The researchers found that the reason for significant differences among members of the empirical group regarding these variables is that the proposed tool applied on the sample of the empirical group has helped in enhancing and developing performance level due to some mechanical variables of javelin throwing through the focus on thrower’s position and forearm movement as this helped to get correct feeling of movement. In addition, consistency movement between back legs movements, body posture and pushing it forward in the throwing step by raising the circle (tool head) with a level suitable for throwing posture. Moreover and tool position, whether near of far from the thrower, increased his own susceptibility to focus on throwing. Frequent training on throwing from a point inside the circle and using approaching speed from various distances in each performance contributed effectively in achievement as well as developing muscular strength for muscles working on the arm. This aims to achieve

suitable mechanical and physical goals for kinetic performance of the approaching stage. Developing this stage is one of the important stages in the ability to control the final speed of the throwing and launching positions as “approaching speed requires controlling movement amount with a great muscular strength to change into the post-approaching stage. This means increasing application difficulty, so this process helped enhance performance level and achievement through consistency in kinetic performance path for javelin throw.

Further, there are high significant differences in the variable of body inclination angle for the empirical group’s members in pre and post tests, while differences were insignificant for members of the control group in post-test due to regular exercises used in the educational method, using the proposed helping tool, achieving proper position for the body at the moment of preparing to throw. In addition, taking proper position for the body is one of the basic requirements of throwing, so a thrower should be consistent with his body position at the moment of throwing with requirements of speed and strength of the forearm, body weight center speed and the rest of body parts and javelin launching speed. Therefore, this tool contributed greatly to enhance other total mechanical variables that affect achievement level through good consistency in various muscular points in upper, lower limbs and trunks. There was a high significant difference for the sake of empirical group in launching angle variable. The researchers think that using the helping tool made clear development in the post-test which led to effective mechanical means included in the educational method as they were applied by an accurate scientific way. Moreover, suitable launching angle is one of the important and effective mechanical means at the horizontal scope through the throwing bow and the posture of the throwing arm with back flexibility are the causes of forming this angle. (Hossam Eldin, 1993) thinks that if a player changed the height or speed of the tool, the angle which he throws with should change automatically. In addition, there are factors that may affect launching angle such as body potential, height point and launching speed of the tool, so the helping tool sought to make members of the study sample to focus on a certain point in each throwing attempt as many researchers refer to the important relation between the angle, launching speed and distance. Results showed that the most suitable throwing angle gives the farthest distance if the arithmetic mean of throwing angle in the pre-test for the empirical angle (27.08), while in post-test (34.58).

This is clear evidence on the improvement of performance level especially in launching angle. It is known that the optimal angle of throwing is between 30 and 37 degrees, so this tool achieved its goal of enhancing performance level and achievement as well as being suitable to the level of the study sample members and helped in developing good kinetic body consistency. Using helping tools contributed to make positive educational process in correcting body postures and movements. As for members of the empirical group, there are clear significant differences in some variables due to physical exercises suitable to the level of the control group’s members. Progress rates in these variables were great which means enhancing performance level was because of implementing suitable educational units and helping tools. However, there is weakness in performance level in terms of body inclination angle and the researchers think that body control will need longer throwing path to make achievement, so there was weakness in achieving good consistency among various parts. The flexibility and strength in shoulder muscles in the throwing arm, stomach muscles and the back helps the thrower take the best postures in correct direction of the javelin with launching angle, so the sample of the study did not manage to make good use of it which had a positive effect on performance level and achievement through kinetic analysis to diagnose some technical and mechanical errors of a javelin thrower.

5. CONCLUSIONS:

- Exercises that were performed by the proposed tool led to develop performance level and achievement due to some mechanical variables of javelin throw.
- There are clear significant differences in enhancing the level of performance including launching angle for the empirical group members.
- Using the proposed angle contributed effectively in mastering the throwing posture and developing movement and strength of the throwing arm.
- Using the educational method in the proposed tool helped the empirical group members understand and perceive connections of various body parts.
- There is a significant difference and a great development in performance level for the empirical group members.

Recommendations:

- It is necessary to use helping tools in educational units as they have a positive effect on developing performance level and achievement.
- It is necessary to use and design proper helping means and tools to cope with the abilities of members of the study sample with other games.
- Ensuring body inclination angle the moment of throwing as it is important in achieving goals of throwing positions.
- Ensuring the launching angle as it has a great effect that determines kinetic path of throwing.

6. REFERENCES:

- 1- Abdelaal. E (1990): "The Effect of Using some Educational Means in Learning Passing and Spikes in Beach Soccer for Prep School Female Students", Sports Science and Art Magazine, Vol. 2, Issue#: 2, Helwan University.
- 2- Merdan. H et al (2006): "The Effect of Some Exercises Teaching Javelin Throw for Beginners in Bio-Kinematic Variables", Alqadesia Magazine for Physical Education Science, Vol. 7, Issue#: 2
- 3- Al Fadly, S. A. (2007): "Bio-Kinematic Applications in Sport training and Kinetic Performance", Baghdad
- 4- Hossameldin, T. (1993): "BioMechanics", 1st Edition, Cairo, Dar Al Fekr Al Arabi.
- 5- Hossameldin, T. (1994): "Principles of Scientific Diagnosis of Movement", 1st Edition, Cairo, Dar Al Fekr Al Arabi.
- 6- Abdelbasir, A. (1990): "Biomechanics: Theory and Practice in Sport", Cairo, Al Ketab Center for Publication and Distribution.
- 7- Abdelrahman, A. & Shaker, E. "Studying the Effect Bio-Kinematic Variables of Javelin Launching Stage on Achievement Distance", Alam Al Riada Magazine, International Academy for Sport Technology, Sweden, International Library of Information.
- 8- Hussein, H. K. & Shaker, E. (1998): "Research Methods in Kinetic Analysis", Amman, Dar Al Fekr for Publishing and Printing.
- 9- Hussein, H. K. & Metwally, M. M. (1991): "Biomechanics", Basra University, Dar Hekma Press.
- 10- Hussein, H. K. & Shaker, E. (1991): "Biomechanics Analysis in Track and Field Games", Basra University, Dar Hekma Press.
- 11- Al Khaldy, M. J & Al Amery, F. M.(2010): "Basics of Biomechanics", 2st Edition, Kufa University, Dar Hekma Press.
- 12- Mohamed, J. M (2001): "The Effect of a Proposed Training Program Due to the Most Important Kinematic Variables in Javelin Throw Achievement", Master Thesis, Babylon University, Faculty of Physical Education.
- 13- Othman, M. (1990): "Athletics Encyclopedia: Training, Technique, Education and Arbitration", Kuwait, Dar Al Kalam Press.
- 14- Al Tikrity, W. Y & Al Ebidy, H. M (1990): "Statistical Applications and the Use of Computers in Physical Education", Mousel University, Dar Al Kotob for Printing and Publication.

Address for correspondence

Author : Ebtesam Haidar Baktash* Mahmoud Abbas Abdelhassan**

**Tikrit University , Faculty of Physical Education*

***Al Qalam College, University, Physical Education Dept.*

THE EFFECT OF USING RUBBER ROPES TO IMPROVE SPEED-STRENGTH FOR UPPER LIMBS AND THE ACHIEVEMENT OF JAVELIN THROW

* Marseel Zaya Yalda, ** Azad Ahmed Khalid

*, ***School of physical Education*

Abstract

The study aimed to identify the effect of using rubber ropes to improve speed-strength for upper limbs and the achievement of javelin throw. The period of experiment last (8) weeks, three times per week. The sample consisted of (50) males, which divided into two groups control group (25) and experimental group (25). Paired t-test was used to find the different between pre and post tests for each group. Independent t-test was used to find out the different between control and experimental groups. The results showed that, using rubber ropes had a significant influence on improving speed-strength and achievement in post tests between both experimental and control groups.

Keywords: Effect of rubber ropes, speed-strength performance, achievement, throw

1. INTRODUCTION

As a result of scientific and technical development, the competition became so hard among athletes. This is shown clearly by improving the level of performance and break records, and both by its effectiveness, which led to the best achievements of the investigation based on the involvement of all the human sciences and technology in the sports movement service. Through the link of training science by other sciences the records become closer to the imagination, through the stunning developments in improving fitness and performance level elements. In addition, track and field gets a large part of this development and effectiveness, including the javelin throw, which is one of the most enjoyable events for the player and the fans.

Not only, the future development of sport training becomes linked to the rise of training extents, but also standing by choosing the most effective methods in the training and concentrate on rationing the doses of training, which achieve the best results, which means improving the quality of training not just depending on the improving the sizes of training (Mohamad, 2, 2000).

The physical and skillful abilities are the most important factors for preparing students or players and rise up the physical and skillful level by continuing the process of training, whether training through the various exercises single and complex on the one hand and drawing on some assistant tools which prepared for this purpose on the other hand, the use of an assist in the development work of the muscle group or muscle groups in the human body is just a catalyst in the development of these groups to accomplish the largest and strength as well as in the economic performance of movements and skills in specific game (Diya'a , 78, 2011).

The Importance of research is reflected to show some training by using rubber ropes as a way to develop the achievement in javelin throw, where using the rubber ropes make the performance easier and simple, and enables the student to identify the correct path for the motor performance as well as gets experience of success repeatedly by performing and practicing the skill alone without the help from a teacher (Tariq, 2, 2013)

The problem of research:

the javelin throw depend in its performance and achievement on the technical aspects and in an integrated physically and motor ability and physical characteristics in addition to the mechanical aspects, and every sport events have a particular privacy, for example in track and field the skillful performance the main factor that focuses on it the achievement, as the choosing of the best ways and methods of training which rise up the level of skillful performance and has an important role in it, it should not be forgotten the role of developing the physical elements to improve the level of skillful performance, through following up the both researchers, it has been noticed that most of coaches are depending on weighting training for developing the strengths and achievement and avoid using the modern methods, for instance medical balls and rubber ropes, which used in muscular contractions similar to the movement and thus be effective factor to develop the particular muscular groups for that events in addition to developing skillful performance and achievement, from here the problem of research lies to stand by the effect of such these exercises for developing the speed-strength and the achievement for this event

Object of research:

The aim of research is identifying the effect of training by using rubber ropes on speed-strength for upper limb and the achievement of javelin throw.

Hypothesis of research:

There is a significant difference in speed strength and the achievement of javelin between the both groups experimental and control group in post test.

2. RESEARCH METHODOLOGY AND PROCEDURES:

Research Methodology:

The experimental method was used, so as to suits with the nature of the research problem.

The research community and sample:

The community of research consisted of fourth year students in school of Physical Education University of Duhok (2012-2013), they were 62 students divided to three groups A, B and C. group A was excluded because that group was for female and the research is exclusive for male. Group C was chosen as an experimental group 25 students and group B as a control group 25 students by toss, which represent 86.64% of the research community.

The homogeneity of research's sample:

Content sources were used to identify the fitness elements affecting the achievement of the effectiveness of the javelin, as follows:

1. The explosive strength of the upper limbs.
2. The speed-strength of the upper limbs.
3. Kinetic speed for upper limbs .(Mohamad, 508, 1990)

For the purpose of measuring these elements, the following tests were conducted:

- Throw the Medical ball (3 kg).
- Flex and extend arms in (10 seconds) (Qais and Bastawisi, 345 1984)
- Kinetic speed for arm (Muhammad, 1984.366)

Then, it has been conducted a tests required for these elements, as well as performed some physical measurements such as height, weight and age, after obtaining the data the it has been conducted the necessary statistical analysis (sprains and splaying) in order to ensure the homogeneity of the two groups each separately, as it shown in the table (1) and (2):

Table (1) shows the means, standard deviation, torsion and kurtosis for control group:

Statistical analysis measurements	Units Of Measure	Means	Stander Deviation	Skewness	Kurtosis
Age	Months	294.48	19.99	0.535-	- 0.007
Height	centimeters	175.04	5.94	- 0.015	0.667
Weight	kilograms	69.28	7.23	0.607	0.406
Explosive strength for upper limbs	Meters	7.27	1.00	0.362	- 0.210
Speed-strength for upper limbs	Numbers In 10 seconds	10.60	1.32	0.939	0.742
Kinetic speed for arm	Numbers of Rounds in 20 seconds	63.60	6.60	- 0.380	- 0.639

As it appears from table (1) that the value of the torsion coefficient and kurtosis of the control group is between (+3 and - 3) which shows the homogeneity of the group

Table (2) shows the means, standard deviation, torsion and kurtosis for experimental group:

Statistical analysis measurements	Units Of measure	Means	Stander Deviation	Skewness	Kurtosis
Age	months	298.32	14.44	0.651	- 0.486
Height	centimeters	175.36	6.03	- 1.003	1.714
Weight	kilograms	68.20	7.32	1.143	2.180
Explosive strength for upper limbs	meters	7.33	1.06	0.239	- 0.621
Speed-strength for upper limbs	Numbers In 10 seconds	10.84	1.51	0.681	- 0.305
Kinetic speed for arm	Numbers of Rounds in 20 seconds	65.36	5.09	- 0.119	0.090

As it appears from table (1) that the value of the torsion coefficient and kurtosis of the control group is between (+3 and - 3) which shows the homogeneity of the group.

Equalization of samples of Search:

For the purpose of Equalization for samples, the t-test was applied for the following variables age, height, weight and the fitness elements those affecting on the javelin throw and pre-tests of samples in achievement of the javelin, as it shows in the table (3)

Table (3) means and standard deviations for the variables age, height, weight, fitness elements affecting those affecting on the javelin throw, and pre-tests of samples in achievement of the javelin.

Statistic analysis Measurements	Control group		Experimental group		T. value
	means	St.d±	means	St.d±	
Age / months	294.48	19.99	298.32	14.44	0.31
Height / centimeters	175.04	5.94	175.36	6.03	0.18
Weight / kilograms	69.28	7.23	68.20	7.32	0.58
Explosive strength / meters	7.27	1.00	7.33	1.06	0.22
Speed-strength / In 10 seconds	10.60	1.32	10.48	1.51	0.59
Kinetic speed for arm / Rounds in 20 seconds	63.60	6.60	63.36	5.09	1.05
Throw javelin / meters	26.78	5.01	26.22	4.10	0.43

t- Value significance at level (0.05) with the degree of freedom (48) is (1.68).

It can be seen from the table (3) the equalization of both research groups, there was no significant differences between both groups, where the t calculated value was less than the tabular value, which was (1.68) with significance level (0.05) and the degree of freedom (48).

Research Procedures:

Experimental design:

The experimental design was used which calls (Designing the Equivalent Groups for Pre and Post-Tests) (Raja, 207, 2004).

Research Variables:

The study includes the following variables:

1. The independent variable: The exercises of rubber ropes.
2. The dependent variable: speed-strengths and achievement of the javelin.

Thus, it should identify the variables and be controlled through controlling the internal variables, which are conditions of the experiment, measuring tools, test differences and Leavers of experience) and external variables which is the vacancy of errors for experience.

Pre-Tests:

The pre-test was conducted for research samples on Monday 30th of March 2013 at Stadium of School of Physical Education, University of Duhok.

After the warming up for 30 minutes, the test of javelin as instructed by the international law of the Games track and field amateur test (Sareeh, 2011), but give each student only three attempts

Rubber Ropes Exercises:

Experimental approach included a set of (4) exercises, which is associated with using rubber ropes which reflects the intensity of these exercises, control and increase the intensity of the exercises is by progressively increasing the number of ropes while performing the exercises for improving the speed-strength of upper and lower limbs, where the experimental approach consisted of (8) weeks (3) times in a week for, so the numbers of training units became (24) units.

Post-Tests:

The post-tests were conducted on Monday 27th of May 2013 at the Stadium of School of Physical Education, University of Duhok, under the same conditions of pre-tests.

Statistical Analysis:

- Means
- Standard deviation
- Skewness
- Kurtosis
- Independent t-test
- Dependent t-test
- Spss

(Shafiq, 111 161 181, 186, 421, 2006).

3. RESULTS AND DISCUSSION:

Results:

The results of speed-strength and javelin achievement between pre and post tests for the control and experimental groups:

Table (4) shows the mean, standard deviations and (t) value for speed-strength and achievement of javelin between pre-post tests for control and experimental groups

Statistic analysis Measurements	units	Pre test		post test		T. value
		means	St.d±	means	St.d±	
speed-strength control group	meters	10.60	1.32	11.00	1.35	*4.00
speed-strength experimental group	meters	10.84	1.51	11.80	1.41	*6.08
Achievements Javelin control group	meters	26.78	5.01	27.36	4.78	*6.30
Achievements Javelin experimental group	meters	26.22	4.10	29.93	3.21	*13.98

(t) Scale value significance level (0.05) and the degree of freedom (24) = (1.71)

Table (4) shows:

- There is significant differences between the pre-post tests for speed-strength between both groups for post tests, where the (t) calculated value was (4.00, 6.08) respectively which is greater than the (t) scale value, which is (1.71) at the significance level (0.05) with the degree of freedom (24)
- There is significant differences between the pre-post tests for achievement of Javelin between both groups for post tests, where the (t) calculated value was (6.30, 13.98) respectively which is greater than the (t) scale value, which is (1.71) at the significance level (0.05) with the degree of freedom (24)

The results of speed-strength and javelin achievement in post tests for the control and experimental groups:

Table (5) shows the mean, standard deviations and (t) value for speed-strength and achievement of javelin post tests between control and experimental groups

Statistic analysis Measurements	units	Control group		Experimental Group		T. value
		means	St.d±	means	St.d±	
speed-strength for post tests	meters	11.00	1.35	11.80	1.41	*2.04
javelin achievement post tests	meters	27.36	4.78	29.93	3.21	*2.23

(t) Scale value significance level (0.05) and the degree of freedom (48) = (1.68)

- There is significant differences for speed-strength in post tests between both groups for experimental group where the (t) calculated value was (2.04) which is greater than the (t) scale value, which is (1.68) at the significance level (0.05) with the degree of freedom (48).
- There is significant differences for javelin achievement in post tests between both groups for experimental group where the (t) calculated value was (2.23) which is greater than the (t) scale value, which is (1.68) at the significance level (0.05) with the degree of freedom (48).

4. DISCUSSION:

Discussing the results of speed - strength tests and javelin achievement between pre - post tests for control and experimental groups:

There is significant improvement in speed - strength to achievement of Javelin throw between pre and post tests for the control group, where it has been attributed that this development is the result of performing a special exercises effectively for javelin, those used by teacher during the period of the lesson.

There is a significant improvement in speed - strength and achievement of Javelin throw between pre and post tests for the experimental group, where it has been attributed that using the rubber ropes lead to increase the flexibility of the joints, as well as the develop muscle strength and thus lead to an improvement in the time of speed performance (Sawsan, 2005, 5).

Discussing the results of speed - strength tests and javelin achievement for post tests between control and experimental groups:

There was a significant improvement in speed - strength and achievement of Javelin throw between for post tests between control and experimental groups but it was greater in experimental group, which has been attributed that using the rubber ropes in training program has an effective role to develop the muscles those work during the performance, where the exercises were performing similar to the technique of Javelin throw, as(Abo Al- Alah and Nasr aldeen ,1992) stated that using exercises similar to the general performance of skills lead to better results.

As the exercises used in the program lead to highlight the resistance on the working muscles during the training which led undoubtedly to increase the ability of working muscle fiber during the performance and produce speed-strength during the special performance, and this result of the development of this type of strength that required to be improve and develop of the study. As (Sareeh ,175, 2003) Indicated that the muscle fibers have the ability to produce a large amounts of strength during changing the resistances type compared to the steady resistance which depends on the non-changing in it, thus the number of working motor units will grow and grow according to their ability to produce kinetic energy. This is what has already been achieved in the present study.

5. CONCLUSION:

The results showed that, there is a significant different in speed-strength and achievement in pre and post tests for both control and experimental groups. Additionally, using rubber ropes had a significant influence on improving speed-strength and achievement in post tests between both experimental and control groups.

6. REFERENCES

- 1- Abo- Alola Ahmad and Naser Al- deen Radwan, The Physiology of Body Ability, Dar Al- Fiker Al- Arabi, Cairo (1992).
- 2- Daia'a Thamir Muttar Al- Shaibani, The Affection of Training Course by Using Helping Aid in Developing The Speedy Power for The Young Basket Ball Players, Issued Research- Al- Qadesiyah Magazine, vol.11, Number.3, (2011).
- 3- Qais Naji and Bastawessi Ahmad, (Tests and Measurement and Principles of Statistic in the Sportial Field), University of Baghdad Press, (1984).
- 4- Muhamad Abdul Hameed Billal, The Affection of The Electrical Polymetric The Basic Principles of Basket Ball, P. H. D thesis, College of Physical Education, Al- Xendria University ,(2000).
- 5- Mohamad Othman, Track And Field Encyclopedia, Dar Al- Fiker Al- Arabi, Kuwait, (1990).
- 6- Muhamad Subhi Hussain, Measurement in Physical Education, Dar Al- Ma'aref, Cairo, (1984).
- 7- Raja'a Mohmood Abo A'alam , Research Courses in The Educational and Phsyologic Sciences, Dar Alnasher Ielgameaat, Cairo, (2004).
- 8- Sawsan Takwee, "The Affection of using the Rubber Rops inside The Water on The Body Abilities", Al- Bahrain (2005).
- 9- Shafiq Al- Atoum – Methods of Statistics in The Economical and Administrative Applications (SPSS), Dar Al- Manaheg for Issuing and Distribution , Amman, Jordan (2006).
- 10- Sareeh Abdul Kareem Al- Fadhli, (International Association of Athletic Federation- Competions Rules), translate and prepration, (2011).
- 11- Sareeh Abdul Kareem Al- Fadhli , (The Affection of The Changeable Resisting in Improving The Ability of The Legs Muscles), Issued research , Baghdad – vol. 1, Mage. 12 , (2003).
- 12- Tariq Nazar Al- Talib, (The Affection of Using The Rubber Rops in Technical Gymnastic for Men), Issued Research , Baghdad, (2013).

Address for correspondence

First author :Marseel Zaya Yalda -School of physical Education

E-mail : dr.marseelyalda@gmail.com

Second author :Azad Ahmed Khalid -School of physical Education

E-mail : Azad71us2000@yahoo.com

THE EFFECTIVENESS OF USING THE SOCIAL NETWORK SITES BY PHYSICAL EDUCATION DEPARTMENT IN PTUK – KADOORIE

Jamal S.Abu Bsharah

Palestine Technical University – Kadoori (PTUK)

Abstract

The aim of this study is to identify the effectiveness of using the social network sites among the Physical Education students in PTUK . The study sample , which consists of (102) students in the year 2013/2014 , uses the descriptive methodology by describing and analyzing the students responses toward the questionnaire . The results of this study show that about 88.4% of the study sample use these sites to communicate with old friends , about 85.5% improve their sports culture , and the study shows that 72.6% believe in that social network sites are indispensable sources for communication between people . It also shows that there are statistically significant differences in using the network sites among the Physical Education students for both bachelor and diploma , in favor of the bachelor students. The researcher recommends the necessity of paying attention to the social network sites as an important educational mean according to modern educational means , using the modern communication technology by the teaching staff members in the courses which they teach , and creating several students groups in the social network sites to discuss all the sports issues and exchange knowledge and culture between them .

Key words: Social network sites , physical education , students , face book .

1. INTRODUCTION

Today , communities are living in the age of rapid change , development , enormous knowledge explosion and openness to the big world which has become a small village because of the speed of the communication and transportation . Perhaps the Internet technology has changed our life course and moved us from the information age to the world wide web , which is considered as one of the modern techniques that has helped in the speed spread of communication and networking means .

Khaled (2005) says online social network sites , such as Face book , have been recognized as new social media which face a dynamic movement of spreading and development . It was a virtual society in a narrow and limited range , then it has increased by time to shift from an information written text tool to an audio-visual media tool that affects the decisions and the responses of the affected persons .(p.5)

Almansour (2012) says that E-network sites are considered as the most widespread on the Internet because of its properties which distinguish them from other websites , and that has pushed the Internet surfers from all over the world to the increasing demand for them despite the several criticisms that the social networks always face . One of these criticisms is the negative direct impact on the family society and its fragmentation . However , there are some people who see it as an important mean of growing and fusion between communities , approximating of concepts and visions with the others , and learning about and knowing different cultures of nations .(22-23)

Information technology and Internet with their different means and tools , such as the social network sites , have provided great services to humanity in various social, economic and industrial fields . Certainly, the entry into the world of sports, training, management, marketing and other branches of sports world had added many dimensions for easy spread . Furthermore , social network sites have become the most important channels that can gather the largest human group from all over the world without any distinction between race, color, religion or geographical area.

Mones (2008) refers to the extent of the help of the social networking for Physical Education students in the understanding of many mathematical concepts , the defining of technical aspects of many dynamic skills to students , providing them with the required dynamic experience , providing them with immediate feedback constructively, and absorbing different teaching methods.

As Balskany (2012) ,in many studies, points that social network sites provide real chances for teachers and students ,alike , to interact and socially connect , allow students to access the content of the courses easily and straightforwardly , encourage students to share their duties , homeworks , and the school projects between each other , and form a kind of stimulus for them .

The Study Problem

The E– network sites have become one of the most important effective means of social communication , because it connects between mates , friends , persons and even different communities . The most important websites , which provide this kind of communication in all political, social, sporting and economic levels , are Face book , Instagram and Twitter .

The researcher also notices that the percentage of the networks spread are daily increasing , especially among universities students , and its use is diverse between positive and negative , also its strong impact on this big category in our society .

Moreover , the researcher notices , via his academic follow up and his using of these websites in some courses which he teaches , the students interaction range by the homework which they have to do . So , this leads the researcher to shed the light on this phenomenon in our community , especially in the Physical Education department .

Literature Review

Helmi Ammar and Abdul-Baki Abu Zaid (2001) had conducted a study on a sample of school teachers , curriculum specialists , students of secondary stage , and university students in the Kingdom of Bahrain. This study aims to identify the impact of communication technology on the education quality and the current and future work areas for youth , and the impact of communication technology on social relations. Both researchers have depended on the descriptive method , the survey , by the questionnaire and the personal interview to collect data . In fact , the study has found that the students tend to make friendships and relations via Internet more than others , it has also shown that what the communication technology offers of positives are more much than its negatives in terms of easy communication , and increasing and availability of information .

Mohammed Khulaifi (2002) has conducted a study on a sample of 137 university students . The aim of this study is to identify the impact of the world wide web in the community by finding the advantages and disadvantages of the Internet. The researcher has used the descriptive analytical method by using personal interviews , and private questionnaires. In fact , The study has found that about 91.7 of the members of the study population tend to use the Internet for communication , exchanging of information with others, searching for information , and entertainment.

In 2006, Al Al-Shaikh has conducted a study on (911) students from King Saud University , in order to identify students' attitudes toward the impact of cultural globalization which is presented by television channels programs and the use of the Internet. The researcher has used the descriptive method , the survey , by using a questionnaire which has been distributed on a random sample to collect data. In fact , the study has found that there is a conviction among the study population that the Internet gives positive changes to the youth's ideas , it has also found that the majority of the study sample sees that the availability of modern communication techniques gives a sense of independence and self-confidence.

In 2007, a study has been conducted by Al-Majjali on Mu'ta Jordanian university students , the aim of it is to identify and analyze the phenomenon fact of using the Internet in terms of highlighting the social results of using it on the university students from the point of view of a students' sample. The researcher depends on the social survey methodology and the questionnaire to collect data. In fact ,the study has found that there is an increasing of the social relations by using the Internet in the case of using the Internet alone, but decreasing in the case of using them with others , also , whenever the internet use increases , the impact of the use on the social relations increases , and if the education level of the students increases , the impact of using the Internet on the social relations decreases .

Al-Otaibi (2008) has conducted a survey that includes students from three Saudi Arabian universities (King Sa'ud, King Faisal, King Abdul-Aziz) , it aims to identify the motivations of using Facebook. The researcher uses the questionnaire as a mean of collecting data. In fact , the study has found that the curiosity and the first participation were the primary motivations behind using the students of Facebook , , and it has showed a large spread (77%) for using Facebook among students.

Khader (2009) has conducted a study on a sample of Cairo University and the British University , it aims to identify the motivations behind the students use of Facebook. The researcher has used the descriptive method by depending on the questionnaire as a mean of data collection. In fact , The study has found that the entertainment motivation of the most important motive of using Facebook , it has also showed that the social interaction between people by Facebook develops the personal skills ,life experiences and dealing with others.

Aren Karpinski (2010) has conducted a study which aims to identify the impact of using Facebook on the academic achievement among university students. The study has been conducted on a sample of 219 university students. In fact , the results has indicated

that the grades scored by the addicted university students to the Internet and Facebook browsing , the largest online social networks , are much lower than those which are received by their counterparts who do not use this site.

Al-Homsi (2010) has applied a study on a sample of Damascus University students from different majors and different economic conditions , it aims to shed the light on the relationship between Internet addiction and social networking skills. The researcher had depended on the descriptive analytical method and used the measure of the Internet addiction and the measure of social relations. In fact , the study has found a significant correlation between Internet addiction and social networking skills , the study has also showed that females who are addicted to the Internet are more than males because of the nature of the socialization of women in our societies.

Herjohnr (2011) has conducted a study entitled with " Views of Physical Education students about social network sites " on a sample of 180 students from the Physical Education department in Turkish Sakarya University. The researcher has used the questionnaire and the personal interview as a mean of data collection. In fact , the researcher has found that most of the study sample uses websites to get information about sports organizations and institutions (55%) , the researcher has also concluded that there is a lack of trust in these websites , especially with regard to aspects of personal life.

Al-Yaman (2014) has examined the extent of using of the social network sites by the Physical education teachers in the academic and social aspects. The researcher has used the descriptive method by distributing a questionnaire on a sample of Gazi University (167) students , then he has concluded that he can effectively use these websites in teaching.

The study objectives

The study aims to identify the effectiveness of using the social network sites in the Physical Education Department , to identify the goals that students are seeking to achieve by using these sites , and to identify to which extent of using these sites will interfere with the students personal lives.

The study questions

The study seeks to answer the following questions:

1. What are the objectives of using SNS by the Department of Physical Education students ?
2. How effective is the use of the internet and the SNS for physical education?
3. To what extent does the SNS interfere with the personal lives of the Department of Physical Education students ?
4. Are there any statistically significant differences in the study area which are related to academic degree variable ?

2. METHOD

This research was carried out by using descriptive / survey method ,data collection tool was developed by Herguner (2011) and modified by the researcher and it has three dimensions. In the 1st dimension of the instrument , there are questions about the usage purpose of social networking sites and in the 2nd dimension there are items about the effectiveness of using social networking sites in physical education .In the 3rd dimension, determining the information and thoughts of individuals concerning the reliability and intervention of social networking sites to private lives of persons were aimed .Validity and reliability of survey revealed that Cronbach Alpha value was found as 0.904. To ensure the stability of the study tool, the researcher has applied it on a prospective sample of (20) students outside the study sample. Then , applied it twice with a time spacer for two weeks between the first and second application. Actually , Pearson correlation factor has been calculated between the two applications results, the stability range factors are (0.960) for the first dimension , (935) for the second dimension , and (0.953) for the third dimension.

In fact, the correlation factor value of the whole questionnaire is (0.953) , which is a very acceptable value to conduct such a study.

The instrument was applied to 102 students attending physical education department in Palestine Technical University -Tulkarm - Khadoori .The data were analyzed by using several statistical methods like mean, T test, ANOVA, Pearson correlation.

The study population :

The study has included all the Diploma and Bachelor students of the Physical Education Department who register for the year 2013/2014. They are (411) students according to the records of the Admission and registration deanship in Palestine Technical University – Tulkarm- Khadoori .

The study sample:

A random stratified sample has been chosen from the study population. It consists of (102) students who form the percentage (25%) of the study sample. Table (1) shows the study sample distribution according to the study variables.

Table (1) the members of the study population properties :

variables	Levels	frequency	Percentage
-----------	--------	-----------	------------

Academic degree	Diploma	63	61.8%
	Bachelor	39	38.2%

Findings and discussion :

The followings are the findings overview which have been reached after the researcher has collected the data by the study tool , he has introduced them according to the study questions:

First , to present and discuss the results which are related to the first question , What is the purpose of using the social network sites among the Department of Physical Education students ? . To answer the first question , the researcher has used the arithmetic averages. (Table 3) results show that:

Table (2): the distribution of the purpose of the use of SNS

	Aims of using SNS	Totally agree	Agree	Have no idea	Disagree	Strongly disagree
S1	I have a good time	27.2	60.2	6.8	4.9	-
S2	I guess the results of sports matches.	20.4	35.9	34	5.8	2.9
S3	I meet new people.	33	46.6	11.7	5.8	1.9
S4	I share my photos and videos with people.	13.6	35.9	26.2	12.6	10.7
S5	I share/discuss developments on the agenda with my friends.	26.2	48.5	17.5	4.9	1.9
S6	I get rid of my loneliness.	40.8	29.1	17.5	4.9	6.8
S7	I can reach my old friends.	53.4	35	7.8	1.9	1
S8	I can express myself more comfortably.	36.9	33	12.6	11.7	4.9
S9	I can have a good time during the day.	29.1	49.5	9.7	8.7	1.9
S10	I can be informed about technical developments in Physical Education and Sports.	1.9	29.1	16.5	1.9	-
S11	I enjoy logging on these sites.	1.9	35.9	25.2	25.2	1.9
S12	I can share my feelings and opinions.	1.9	38.8	18.4	9.7	5.8
S13	I think I strengthen my social ties.	32	35	19.4	10.7	1.9
S14	I feel more peaceful and happier.	20.4	43.7	24.3	8.7	1.9

S1 5	I can learn what my friends are doing	32	45. 6	14.6	4.9	1.9
---------	---------------------------------------	----	----------	------	-----	-----

As it is illustrated in Table (3), a percentage of (88.4%) of the study sample is distributed into (35% agree , 53.4% strongly agree) in responding to the phrase " I can reach my old friends.". Also, that is approximately 60.2% of the study sample agree, and a percentage of 27.2% strongly agree on the statement " I have a good time ". Then , the statement I share my photos and videos with people." has a percentage of 49.5% (35.9% agree , 20.4% strongly agree). However , the statement " I guess the results of sports matches." has a percentage of (56.3%) of the study sample which is distributed into 35% agree and about 20.4% strongly agree.

The researcher finds that the nature of the social network sites, that are used by the study sample, are interesting and desires achieving for students in terms of communicating with childhood and school friends, well as making them feel some kind of happiness and enjoying their private times especially in our present time. Our present time is rapidly developing , particularly the smart phones technology and its applications that can be used for social network sites , especially with the availability of wireless internet in all university places, by which they can enjoy their free time between lectures through spending their time using the social network sites. However , the researcher finds that there is a kind of lack of confidence in sharing photos and videos between students who use these websites, especially by females, so, that sentence has a lower percentage.

Secondly, to present and discuss the results of the second question , How effective is the use of the internet and the social network sites in Physical Education?. To give an answer to the second question, the researcher has used means , the results in (Table 3) shows that.

Table (3): the distribution of SNS in Physical Education.

	Using SNS in physical education	Totally agree	Agree	Have no idea	Disagree	Strongly disagree
S16	I keep informed about sports organizations.	35.9	42.7	17.5	2.9	-
S17	I am recognized more easily among colleges/students.	17.5	56.3	19.4	5.8	-
S18	I can communicate with prominent people in my field.	37.9	39.8	18.4	2.9	-
S19	I can keep informed about the events on Physical Education and Sports.	26.2	43.7	20.4	20.4	3.9
S20	I improve my culture of Physical Education and Sports.	50.5	35	12.6	1	-
S21	I can find solutions to the problems I face in my profession field.	25.2	47.6	18.4	3.9	3.9
S22	I can share my knowledge and opinions on Physical Education and Sports.	26.2	43.7	20.4	20.4	3.9
S23	I can share my political and social opinions related to physical education	13.6	35.9	37.9	8.7	2.9
S24	I think I spend my time effectively.	2.9	49.5	21.4	8.7	2.9
S25	I keep informed about rules and laws of sports	32.	31.1	34	1.9	-

As it is illustrated in Table (3), the phrase "I improve my sports culture of physical education and sports " has a percentage of 85.5% of the study sample distributed between 35% agree and 50.5% strongly agree , which is a very high percentage. The researcher finds that this is due to the nature of the study sample because most of them are subscribers in various sports websites .

However , the phrase "I can share my political and social opinions related to physical education " has a percentage of 49.5% which are distributed between 35.9% agree and 13.6% strongly agree. The researcher attributes that due to lack of students' trust in social network sites and fear of being monitored by the Israeli security agencies , therefore many students prefer to avoid the discussion of political issues even they are related to sports.

Third , to present and discuss the results of the third question , How does the use of the internet and social network sites interfere with personal life?

To answer the third question, the researcher has used the arithmetical averages of the study sample responses , (Table 4) shows that.

Table (4) The frequency of the information and the thoughts of participants about the intervention of SNS to private lives of persons

	the intervention of SNS to private lives of persons	Totally agree	Agree	Have no idea	Disagree	Strongly disagree
S26	I think social network sites cause intervention of private life of persons.	34	32	26.2	5.8	1
S27	I think social network sites are secure sites.	8.7	11.7	28.2	24.3	26.2
S28	I think social network sites have more negative effects than positive effects.	23.3	27.2	32	12.6	3.9
S29	I think social network sites are indispensable communication sources of our day.	17.5	52.4	20.4	6.8	1.9
S30	I think social network sites keep my personal information safely.	7.8	28.2	35	11.7	16.5
S31	I see no harm to upload photos and videos to social network sites	16.5	27.2	22.3	16.5	16.5
S32	I think social network sites take necessary precautions to protect my photos and videos.	9.7	26.2	32	21.4	9.7
S33	I am concerned that unwanted persons and/or the people I don't know can reach my information, photos and displays through social network sites	27.2	35.9	21.4	9.7	4.9

As it is illustrated in Table (4) , the phrase "I think that social network sites are indispensable sources of communication of our day," has a percentage of 72.6% of the study sample between agree and strongly agree. The Researcher finds that it is a logical result due to the increasing number of subscribers who use such websites , this is an evidence that it has become a part of their lives because of the large space and the massive technological progress , and the electronic devices have become , from smart phones and computers , the basics for most of the people.

Approximately 66% of the study sample sees that websites interfere with their personal life due to the lack of trust in these websites , so this is an evident in the student responses to the phrase " I'm concerned that unwanted persons I don't know can reach my information , photos and displays through social net work." has a percentage of 63.1% of the study sample. However , it has been seen that about 35.9% of the study sample websites which take protective actions into consideration to protect any personal files , so approximately 64.1% of the study sample sees the opposite.

Fourth , to present and discuss the results related to the fourth question , Are there any statically significant differences in the fields of study due to the academic achievement variable ?

To answer the fourth question, the researcher has used test/s for two independent groups , (Table 5) shows the results .

Table (5) : The results of the test of two independent groups to signify the differences in the target of using SNS according to the Academic degree variable.

	Bachelor (n=39)		Diploma(n=63)		T	significance
	M	SD	M	SD		
Aims of using SNS	2.06	0.59	2.10	0.44	1.88	.173
Using SNS in physical education	2.73	0.65	2.57	0.45	4.67	*.033
the intervention of SNS to private lives of persons	2.09	0.51	2.06	0.45	1.152	.286
	2.24	0.45	2.30	0.33	2.88	.093

***significant ($\alpha \leq 0.05$)**

As it is illustrated in Table (7) , there are no statistically significant differences at the significance level ($\alpha \leq 0.05$) for the field of the target of using the social network sites , and the field of the interference of the internet and the social network sites with the personal life of the student. However , there are statistically significant differences in the effectiveness of using of the internet and social network sites by Physical Education particularly the Bachelor students.

The researcher has attributed the lack of statistically significant differences in the field of the target of using the social network sites among diploma and bachelor students to the values and the special privileges of diploma and bachelor's students is one and different in terms of providing wireless internet. Also , most of the people are now using these websites, regardless of their academic achievement , therefore they , as students , have similar goals and objectives in using the social network sites.

The researcher also finds that there is a great similarity and consensus from the study sample on the distrust of these sites in terms of the interfering with the personal life of the student, regardless of academic achievement , so there is no statistically significant differences in this field between the bachelor and diploma students.

However , the researcher has attributed the existence of the statistically significant differences in the effectiveness of using the internet and the social network sites for Physical Education to many reasons. First , there are many lecturers and teachers in the Bachelor department who use these websites in home works and assignments. Also, the nature of the bachelor courses, which frequently request the student to back to the internet for several sports information. In addition , there are obligatory assignments related to the technology education course ,through which the student must positively use the social network sites in the Department of Physical Education. Finally , there are many groups that have been created by the students within this course. According to that , it is clear that the differences are in favor of the Bachelor students.

3. CONCLUSIONS:

1. In the light of the Study Objectives and its findings , the researcher has found the following conclusions:
2. The great majority of the students uses the social network sites to connect with old friends.
3. A high percentage of students in the Department of Physical Education exchange cultural information about the physical education and various sports.
4. The majority of the students believe that the social network sites are indispensable sources to communicate with people .
5. There is a lack of trust in the social network sites , these websites do not choose the appropriate means to avoid the strangers from accessing to their privacy.
6. The Physical Education Bachelor students use the social network sites in physical education larger and more efficiently than Diploma students.
7. students.

4. RECOMMENDATIONS:

In light of the findings, the researcher recommends the following:

1. Paying attention to the social network sites and investing the scientific, cultural and social benefits of them.

2. The necessity of paying attention by the teaching staff members in the Physical Education Department to the use of social network sites in the courses which they teach , particularly diploma students, by assigning duties to the students in order to use these sites in performing them .
3. Creating meaningful student groups on Facebook and other websites ,in order to exchange sports information, laws ,competitions and other various sports activities.
4. Increasing the students' confidence in the social network sites through organizing different sessions and seminars of how to use them effectively and positively.
5. Conducting studies to identify the most important constraints and negatives of the social network sites from the viewpoint of students and teaching staff members to put treatment plans and to overcome them.

5. REFERENCES:

- Aal-Al-Sheikh, N. I. (2006). *The impact of the globalization culture on the Saudi youth local values* (Doctoral dissertation). King Saud University, Riyadh.
- Al-Humssi, R. (2010). *Internet addiction and its relationship with the social networking skills Empirical Study on a sample of Damascus University students* (Unpublished MA Thesis). Damascus University, Syria.
- Khaled, S. (2005). *The culture of social network sites and local communities*. Dar Al-Mutanabbi for publication and distribution , Qatar.
- Al-Khulaifi, M. S. (2002). The impact of the Internet on the society. *The World Of Books Magazine*, (22), 5 – 6 .
- Khader, N. (2009, February 15-17). The Psychological and Social effects of using the Egyptian youth the social network sites: *The first Scientific Conference for the family , the media and the challenges of the age*.
- Sa'adeh , J. & Sartawi , A. (2003). *The use of computers and Internet in the education fields* .1st floor , Dar Al Shorouk for Publishing and Distribution, Amman.
- Al-Otaibi, J. (2008). *The impact of Facebook on Saudi Arabia universities students* (Unpublished MA Thesis). King Saud University, Riyadh.
- Ammar, H. & Abdul Baqi, A. (2001). The Communication Technology and its educational and social impact , *An Empirical Study in the Kingdom of Bahrain*.
- Al-Mansour, M. (2012). *The impact of social networking on the audience A Comparative study for the social websites and the Electronic websites* (Unpublished MA Thesis). The Arabic Open Academy, Denmark.
- Aren, K.(2010). *Facebook and the technology revolution* .N ,Y ,Spectrum publications.
- Barlcikanli, G. S.(2012). Social networking in physical education :Undergraduate students 'views on ning *Turkish Online Journal of Distance Education –TOJDE*. (13) , No. 2 (16).
- Mohnsen, B. (2008). *Using technology in physical education* (6th ed). Cerritos ,CA ,Bonnie's Fitware Inc.
- Herguner, G. (2011). Opinions of students in physical education and sports teaching of the use of social network sites. *The Turkish on line journal of educational technology* , 10(2), Sakarya, Turkey.
- Yaman, M.(2014). The use of social network sites by prospective physical education and sports teachers (Gazi university). *The Turkish online journal of educational technology*, 13(1), Sakarya, Turkey.

Address for correspondence

Authors : **Jamal S. Abu Bsharah** . Palestine Technical University – Kadoori (PTUK)

E-mail address : jamal_abubshara@yahoo.com

THE REGULATION OF SPORTS DISPUTES (CAS: INTERNATIONAL LEVEL / TCNSA: TUNISIAN NATIONAL LEVEL)

Ghodbeni Samir* Mohamed Jarraya**

** General Secretary of Tunisian Judo Federation, Teacher in the Higher Institute of Sport and Physical Education, Ksar said Tunisia., PhD Student in Sport Management in Higher Institute of Sport and Physical Education (ISSEP) Ksar Said, Tunisia, Member in Tunisian Research Laboratory "Sport Performance Optimisation" National Centre of Medicine and Sciences in Sport (CNMSS)*

*** Director of Higher Institute of Sport and Physical Education Sfax*

Abstract

Today, Sports is social phenomenon that becomes attached with performance and result. So we have to say that sporting success is based on a trilogy of determining factors:

- A multifunctional sports infrastructure.
- Human and financial resources.
- Appropriate legislation.

Given the increasing number of players and contractual relationships in the sports economy, and increased funding issues and the search for some athletic performance are the means of legally or illegally all these new trends tend to increase the number of disputes and to multiply the sources of conflict

In Tunisia, the legal status is under Associative shape and the rule is to promote and there is non-profit sports

Keywords: Sports-Tunisia-legislation-Performance-Result

1. INTRODUCTION

Tunisian sports legislation is an important tool that was originally the qualitative leap made by sport in Tunisia, particularly in terms of mechanisms to manage the business and sports competitions in order to establish the conditions for better organized, efficient and transparent, in accordance with the noble Olympic values.

The purpose of this legislation is to put the Tunisian sport in tune with developments in the sector in the world. So The Tunisian National Olympic Committee (TNO) has been at the forefront in recent years and was among the first sporting bodies that are attached to modernize legislation in the field of sport in accordance with the regulations of the International Olympic Committee (IOC).

The Tunisian experience in this area is indeed pioneering both at regional and continental and earned him homage and consideration including the IOC and by the President of the Court of Arbitration for Sport (CAS) and the Union of Arab Olympic National Committees (UAONC).

This is the National Committee of Sports Arbitration under the auspices of the Tunisian National Olympic Committee, which now rule by way of arbitration sports disputes. Its jurisdiction is defined by the relationship between sports federations and their members (clubs, athletes, referees, coaches, and medical and para-medical staff), and after exhausting all remedies mentioned in the statutes and regulations said federations.

Research Problem: Can - we consider that the creation of the Court of Arbitration for Sport (CAS) at the International level and the creation of the National Committee of Sports Arbitration (NCSA) at the national level meet the new trends of modern sports?

Research Aim: Our research is inscribed in the context of an assessment of the impact of the CAS and the NCSA in sports, to give a means of resolving sports problems and disputes fast and also adapted to the specific needs of the global sports community.

The International Council of Arbitration for Sport (ICAS)

The ICAS consists of 20 high-level legal members and must be neutral and independent and operate with objectivity, The ICAS's role is to safeguard the independence of the CAS and estimates of the parties and it ensures the administration and financing of the CAS

The Court of Arbitration for Sport (CAS):

The Court of Arbitration for Sport is an institution independent of any sports organization offering services in order to facilitate the resolution of sports-related disputes through arbitration or mediation by means of procedural rules adapted to the specific needs the sports world.

The procedures to CAS:

The Ordinary Arbitration or mediation procedure is applicable to disputes arising from contractual relationships.

The Appeals Arbitration procedure is applied to disputes over decisions of sports bodies.

A consultative process that allows certain asks- organizations outside any litigation - an advisory opinion on any legal question TAS on the practice, the development of sport.

Arbitral proceedings:

The limits of arbitrative disputes submitted to the CAS:

Disputes brought by national laws. litigation brought by federal statutes.

the organization of international sports arbitration:

The permanent arbitration structures Non permanent structure arbitrage

The permanent arbitration structures

The Ordinary Arbitration Division:

It's a procedure designed to settle the trade disputes that may occur in sport. CAS jurisdiction is recognized only to the extent that there is an arbitration clause in the contract, or if an arbitration agreement may be concluded that the differential has arisen

The Appeals Arbitration Division:

It is the most used form of arbitration because it involves disputes over disciplinary decisions taken by international federations and other organizations within the Olympic movement, particularly in terms of doping.

The ad hoc Division

Arbitration procedure that is in place on the occasion of special events such as the Olympics with a mission to finally determine and within 24 hours the disputes arising during the Atlanta Olympic Games.

The Tunisian National Committee of Sports Arbitration (TNCSA) :

Use the Sports Committee specializes in examining appeals against decisions taken by the specialized sports institutions in their relationships with their membership and that after having used all the remedies provided by the provisions and internal regulations of the federation's competence Federal authorities:

Federal commissions: These are internal bodies to sports federations, who adjudicate disputes relating to the sport. They are intended as the first stage of settlement of federal litigation

The National Commission of Appeal

The appellate body responsible for "deciding on appeals against decisions of the League and federal commissions." it is competent to judge the second degree appeals against decisions taken by the leagues and federal commissions. The Tunisian National Committee of Sports Arbitration (TNCSA) a more adaptable Sports Arbitration mechanism with the sport reality in Tunisia, referring to the Tunisian journal arbitration rules and principles organizing the international sports arbitration

National Arbitration Committee shall consist of three arbitrators chosen from the members of the list of arbitrators mentioned in Article 50 of the Statute NLOC.

The National Committee of Sports Arbitration has jurisdiction to rule on the powers made against final decisions taken by sports federations or their competent authorities concerning their relationship with their members. And all decisions made by the NCSA, are final and binding.

Amendments TNCSA: The amendment of the statute of CNOT meets the need to establish an effective legal framework for sports competitions through the restructuring of the sector and the revision of the legislation according to international standards. the Tunisian experience in the field of sport arbitration has had remarkable success through its contribution to adjudicate disputes between clubs and in several sports.

The TNCSA aims, through these amendments, to consolidate the legal basis of sport in Tunisia.

Hypothesis

The CAS and the TNCSA can contribute to treat rapid resolution of sports disputes, costly and adapted to the specific needs of the global sports community.

2. MATERIAL & METHODS

In this research we use a contained Analysis

CAS has evolved in its structures and stands today as an arbitration institution to guarantee effective access to justice for the athletes of the world in time compatible with the pace of the sports competition schedule. a more adaptable Sports Arbitration mechanism with the sport reality in Tunisia, referring to the Tunisian journal arbitration rules and principles organizing the international sports arbitration, and internal statutes and laws of the various member sports federations in the Committee Tunisian National Olympic.

Presentation of cases before the CAS since its creation:

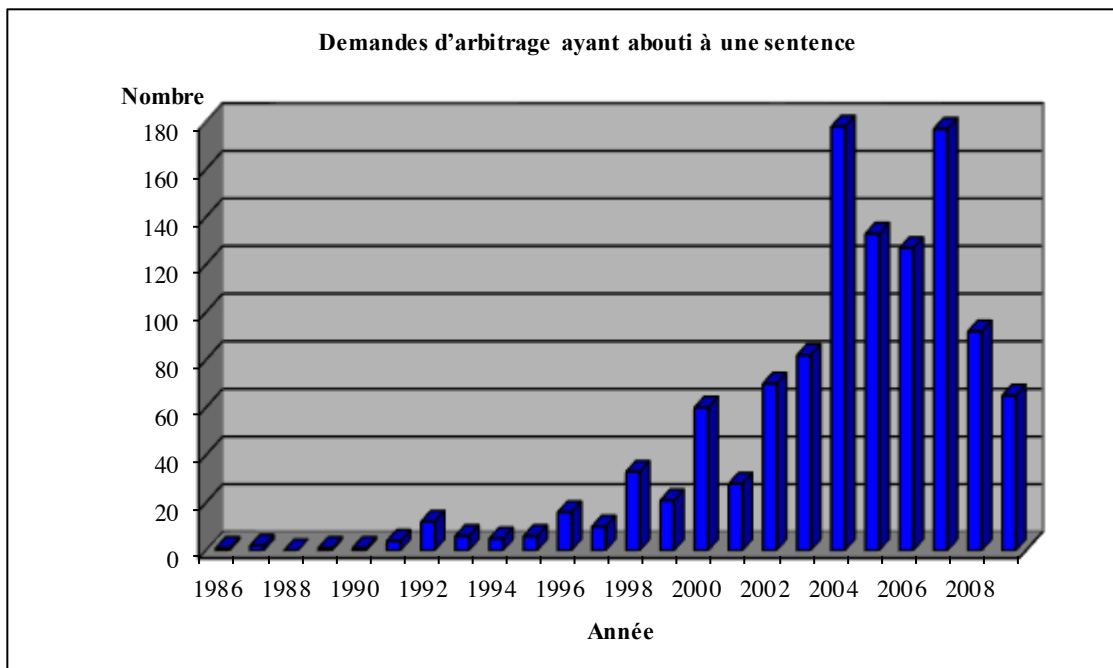
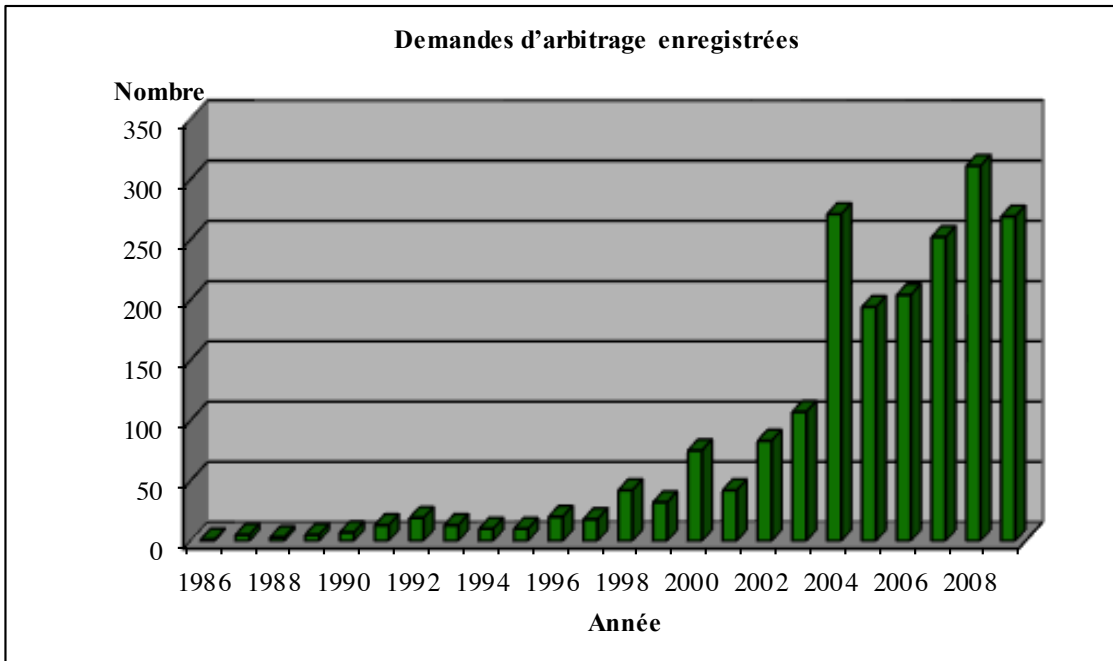
Table listing the cases submitted to the CAS since its inception. The year refers to the date of registration requests only and not that of the publication awards or advisory opinion.

<i>Year</i>	<i>Applications arbitration recorded</i>	<i>Requests for advice advisory recorded</i>	<i>Total</i>	<i>Arbitration requests leading to a sentence</i>	<i>Requests for advice with consultative resulted in an opinion</i>	<i>Total</i>
1986	1	1	2	1	1	2
1987	5	3	8	2	1	3
1988	3	9	12	0	1	1
1989	5	4	9	1	0	1
1990	7	6	13	1	0	1
1991	13	5	18	4	1	5
1992	19	6	25	12	0	12
1993	13	14	27	6	1	7
1994	10	7	17	5	1	6
1995	10	3	13	6	2	8
1996	20	1	21	16	0	16
1997	18	2	20	10	0	10
1998	42	3	45	33	2	35
1999	32	1	33	21	1	22
2000	75	1	76	60	1	61
2001	42	0	42	28	0	28
2002	83	3	86	70	3	73
2003	107	2	109	82	1	83
2004	271	0	271	178	0	178
2005	194	4	198	133	3	136
2006	204	0	204	127	0	127
2007	252	0	252	177	0	177

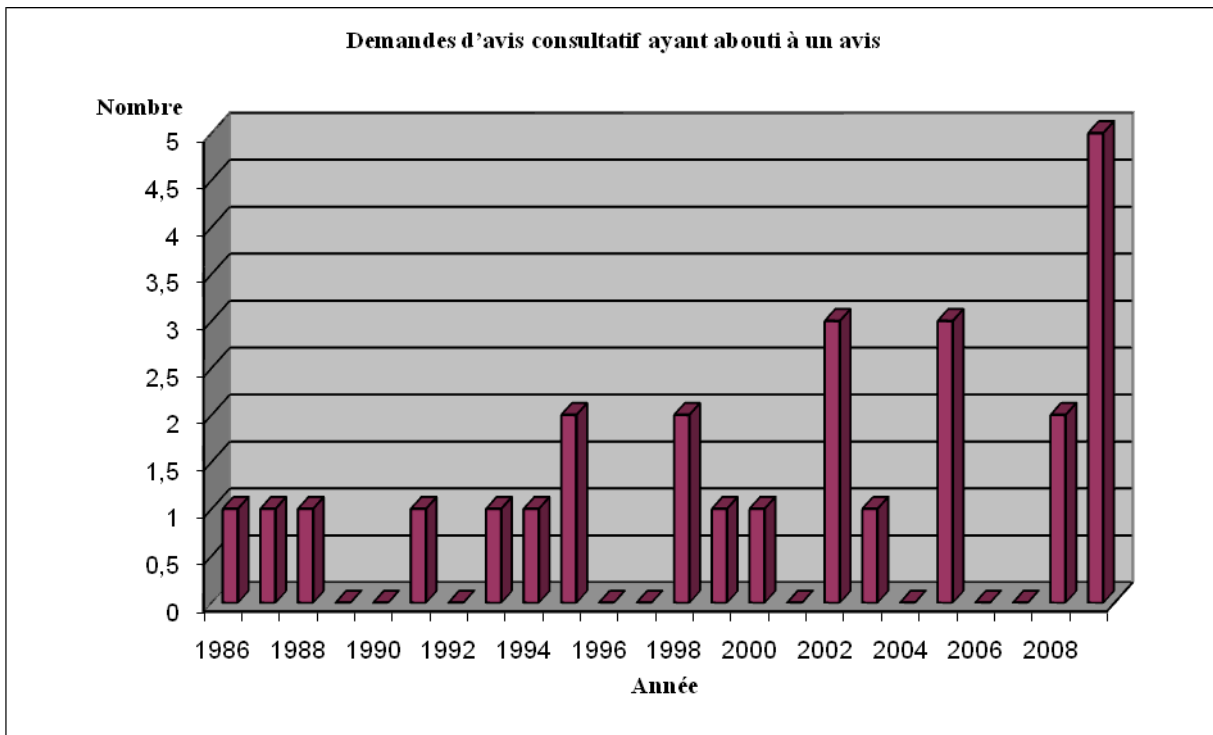
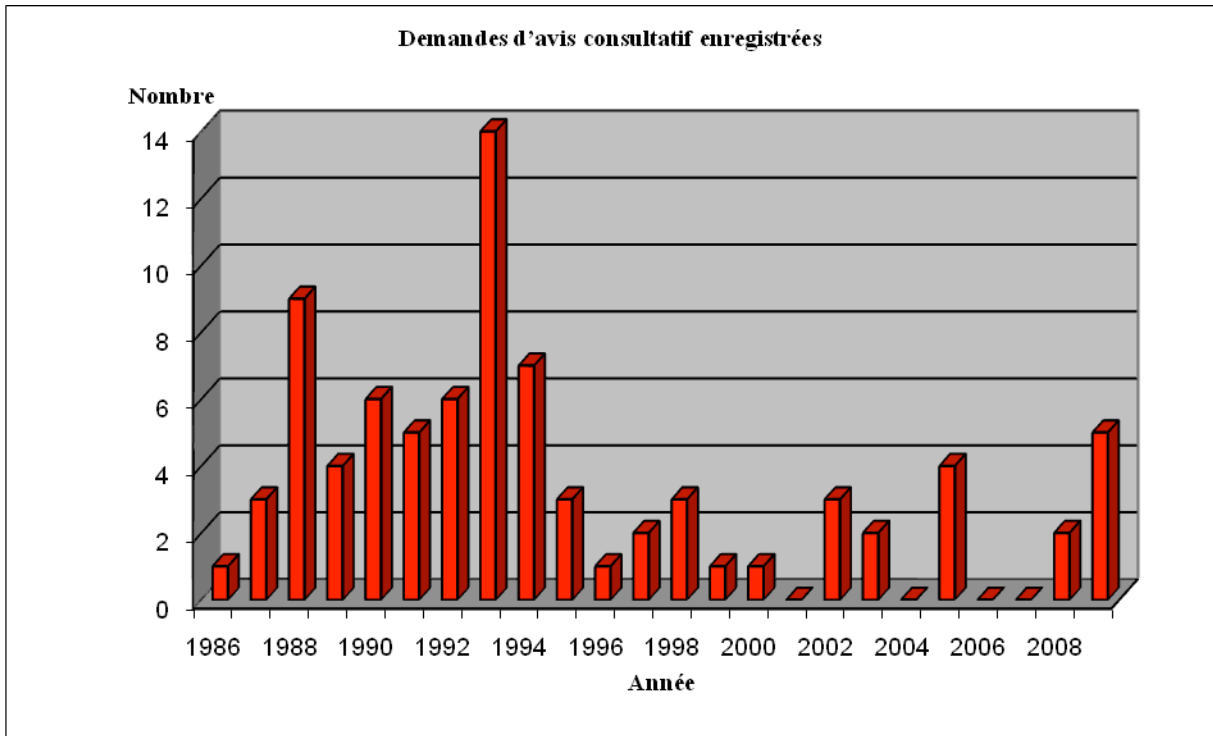
2008	311	2	313	92	2	94
2009	269	5	274	65	5	70
Total	2006	82	2088	1244	26	1270

Presentation of cases before the CAS since its creation:

This Table listing the cases submitted to the CAS since its inception. The year refers to the date of registration requests only .



These graphs show that the number of arbitration claims recorded increased sharply from 1998 due to the recognition of the jurisdiction of the CAS.



These graphs show that the number of requests for advisory opinions fell sharply from 1995 due to the entry into force of Sports-related Arbitration Code posing stricter criteria on access the advisory procedure.

The cases submitted to the Tunisian National Sports Arbitration Committee

Since March 2007 to May 2010:

In Tunisia the total number of records until May 2010 we have 69 accomplished disputes separates like this : □ Football: 34 □ Handball: 07 □ Basketball: 05 □ Volley -Ball: 04 □ Fencing: 04

□ Boxing: 03 □ Taekwondo 01 □ Table Tennis: 02 □ Gymnastics: 02 □ Karate: 01 □ Judo: 02 □ Weightlifting: 02 □ Rugby: 02 □

3. DISCUSSION:

Our analysis shows not only the increase in cases before the CAS and at CNAS but also the competence of these bodies for the resolution of these cases which can offer a means of resolving sports disputes adapted to the specific needs of sports community so our assumption is valid

4. CONCLUSION:

The purpose of this legislation is to put the Tunisian sport in tune with developments in the sector in the world.

The Tunisian National Olympic Committee (TNOC) has been at the forefront in recent years and was among the first sporting bodies that are attached to modernize legislation in the field of sport in accordance with the regulations of the International Olympic Committee (IOC).

The Tunisian experience in this area is indeed pioneering both at regional and continental and earned him homage and consideration including the IOC and by the President of the Court of Arbitration for Sport (CAS) and the Union of Arab Olympic National Committees (ANOCA).

Faced with the steady increase in the dispute between practitioners and their federations, what other system would combine all advantages that an arbitral tribunal, free legal constraints, speeds, immediate execution.

This is the National Committee of Sports Arbitration under the auspices of the Tunisian National Olympic Committee, which now rule by way of arbitration sports disputes. Its jurisdiction is defined by the relationship between sports federations and their members (clubs, athletes, referees, coaches, and medical and para-medical staff), and after exhausting all remedies mentioned in the statutes and regulations said federations.

5. REFERENCES:

Meyer(P), OHADA, droit de l'arbitrage, Bruylant, Bruxelles, 2002.

Rigozzi(A), L'arbitrage international en matière de sport, Helbing et Lichtenhahn, Bâle, 2005.

Chedly (L), Arbitrage commercial international et ordre public transnational, CPU, Tunis, 2002.

Ben Abdallah (H), l'arbitrage sportif international, mémoire en vue de l'obtention du mastère en droit des affaires, FSJPST, 2005-2005.

Thèriot (V), le Tribunal Arbitral du sport, mémoire pour l'obtention du diplôme d'étude supérieur en relation internationales Université de Genève, Institut universitaire de hautes études internationales, 1997.

Amson (Ch), « les jeux olympiques à l'épreuve du droit », Gazette du Palais, Aout 2004.

Kraquillo (J-P), « Sentence du Tribunal arbitral du sport », RJES, Mars 2005.

Kaufmann-Köhler (G), « Atlanta et l'arbitrage ou les premières expériences de la division olympique du Tribunal Arbitral du Sport » bulletin ASA

Mbaye (K), « une nouvelle institution d'arbitrage le Tribunal arbitral du sport », AFDI, 1984.

Reeb (M), « le Tribunal arbitral du sport : son histoire et son fonctionnement », JDI, 2001.

Schwaar (G), « le Tribunal arbitral du sport : une institution pour le règlement par l'arbitrage des litiges dans le domaine sportifs » 1993.

Simon (G), « l'arbitrage des conflits sportifs », revues de l'arbitrage, 1995.

Code de l'arbitrage en matière du sport, Code Tunisien de l'arbitrage, Guide de l'arbitrage.

Address for correspondence

Authors : **Ghodbeni Samir** - *General Secretary of Tunisian Judo Federation, Teacher in the Higher Institute of Sport and Physical Education, Ksar said Tunisia., PhD Student in Sport Management in Higher Institute of Sport and Physical Education (ISSEP) Ksar Said, Tunisia, Member in Tunisian Research Laboratory "Sport Performance Optimisation" National Centre of Medicine and Sciences in Sport (CNMSS)*

E-mail address : ghodbeni_samir@yahoo.fr

THE RELATION BETWEEN FOOT'S LENGTH & WIDTH WITH SOME PHYSICAL ABILITIES AND PERFORMANCE ACCURACY OF SOME BASIC SKILLS OF FEMALE VOLLEYBALL PLAYERS

Nowzad Hussien Darwish

Physical Education School, Koya University

Abstract

The research aims to Identify the foot measurements (length and width) of the sample and Identify the length and width of the foot and their relationship with some physical abilities and accuracy of the performance of some of the basic skills in a game of volleyball in the research sample.

The research sample included on the players posts clubs in the Premier League in the Kurdistan Region (Taq Taq, Brihty) for volleyball, and state their number (24) for the player and the use of researcher descriptive manner relations connectivity, was chosen as the research sample in a deliberate and conduct tests and measurements on the length and width of the foot and some tests of physical abilities and test some of the basic skills was the use of a number of devices and tools and means to collect and process data using appropriate statistical methods and after obtaining the results, was discussed in a scientific manner powered sources to achieve the objectives of the research and prove his hypothesis.

In light of the results of research researcher reached the following conclusions:

- The presence of a significant correlation between the length of the foot and hid the transition speed.
- The presence of a significant correlation between the foot and the transitional speed test and Fitness.
- The lack of a significant correlation between the length and width of the foot, explosive test of strength and balance.
- The lack of a significant correlation between the length and width of the foot transponder test receiver and landslide hit the country.

In light of the above, the resear

Keywords : Relation. Physical. Volleyball. Skills. Abilities.

1. INTRODUCTION

Female football players should possess suitable anthropometric measurements with the game including high physical abilities, optimal performance as they are important conditions. Anthropometric measurements and physical abilities are the most important decisive factors in winning matches, especially when there is an equal skill and planning levels between both teams. Anthropometric measurements are very important in evaluating one's growth and determine weight and height in different age stages. Foot's length and width have a great importance when performing basic movements such as standing, running and jumping. The athlete is the part who forms the base on which the body depends and it helps the foot on body movements as well as toes, especially the thumb help body in movement and balance. The feet are also related to physical abilities such as balance, agility and the ability to direct voluntary movements by individuals towards a certain goal, especially while changing direction and keeping body balance during performing attacking and defense skills. The wider the base is, the more constant the player will be. The feet also have a great effect in increasing shooting power and accuracy in volleyball especially if we know that volleyball is characterized by changing situations between defense and attack. This makes it necessary to employ them well to control matches. Therefore, the optimal choice of players depends greatly on anthropometric measurements, so a trainer must choose female athletes with the needed anthropometric measurements as these measurements are related with a lot of other variables (biomechanical, physical ones) as well as their effect on producing power, speed and accuracy according to the needed aim. The researcher poses the following question: are foot measurements (length and width) related to some physical abilities and the accuracy of performing basic skills in volleyball?

2. METHODOLOGY:

The researcher used the descriptive approach with correlations.

Community & Sample of the Study

The community of the study consists of female players from clubs participating in the volleyball premier league at Kurdistan region (Tak Tak, Braya Ti, Ranya, Koya, Akad and Snharb). The study sample was chosen by the purposive method from female players of Tak Tak and Braya Ti clubs consisting of 24 players. The study sample consisted of 20 female players after eliminating 4 players due to injury.

Variables & Selections of the Study:

The Used Measurements:

- Foot length and width

The Used Physical Tests:

- Speed test
- Agility test
- Constant balance test from the vertical posture
- Explosive ability test for feet muscles

The Used Skill Tests:

- Receiving a serve test
- Diagonal smash shots accuracy test

Main Experiment:

Tests were performed on 18-19/01/2015. The first day was for anthropometric measurements (foot length and width) and physical tests (agility, balance, vertical jump) and the second day was for skill tests (accuracy of receiving serves using arms and diagonal smash shots).

3. RESULTS OF THE STUDY:

Table (1): arithmetic means and standards deviations for variables of foot length, width physical abilities and accuracy:

Variables	Measurement unit	Arithmetic mean	Standard deviation
Foot length	Cm	23.000	0.917
Foot width	Cm	8.225	0.611
Speed	Second	3.198	0.119
Agility	Second	7.800	0.565
Balance	Second	13.720	9.497
Vertical jump	Cm	34.250	4.940
Receiving	Number	10.700	2.296
Diagonal smash shots	Number	8.850	4.893

Results and discussion of relation between foot length and width with some physical abilities:

Table (2) correlation matrix between values of foot length, width and some physical abilities

	Variables	Correlation Value			
		FOOT LENGTH	SIGNIFICANCE	FOOT WIDTH	SIGNIFICANCE
1	Speed	*0.530	SIGNIFICANT	*0.480	SIGNIFICANT

2	Agility	0.315	INSIGNIFICANT	**0.652	SIGNIFICANT
3	Balance	0.251	INSIGNIFICANT	0.351	INSIGNIFICANT
4	Explosive Ability	0.174	INSIGNIFICANT	0.20	INSIGNIFICANT

* Significant at error ratio $\leq (0.05)$ and freedom degree $(20-2=18)$

4. DISCUSSING RESULTS:

Foot length represents its horizontal direction with movement direction in running (speed) on one hand. On the other hand, foot length gives an advantage as a base to depend on at final centralization which has a direct relation with foot length. Accordingly, areas of friction with foot and land will be wider. This helps in body movement in its total speed and that's why the relation was significant. As for agility that depends on changing direction, foot width plays a great role in achieving constancy strength and push body sideward as well as the contribution of foot length as foot axes correspond with axes of movement forward and sideward. In other words, players need foot area to change between stopping continuous movement sideward and then continue at the counter side (zigzag). The anatomy posture of the foot plays an important part in this performance. In addition, foot length and width achieve a good centralization base while changing direction and this feature achieves non-reduction in speed which correlated directly with the time achieved in this test. As for balance, it needs to achieve a great touching period and distributed by direct pressure on middle foot and then transfer. The used mechanism in balance is different from running and ability mechanisms which require from the player to concentrate his weight center continuously within a narrow base which means that the process is related to the nervous aspect more than physical aspects. As for explosive power, it depends on both strength and time. This is a mechanical rule and maybe there is a difference in power proportions despite the presence of lengths and widths on one hand. On the other hand, there will be a weakness in the strength of thighs and feet that play an important role in affecting explosive power which depends greatly on both thigh and feet muscle strength.

Table (4): correlation matrix between values of foot width and length and accuracy of performing basic skills

	Variables	Correlation Value			
		FOOT LENGTH	SIGNIFICANCE	FOOT WIDTH	SIGNIFICANCE
1	Receiving	0.012	INSIGNIFICANT	0.176	INSIGNIFICANT
2	Diagonal smash shooting	0.090	INSIGNIFICANT	0.202	INSIGNIFICANT

There is no significant relation at error ratio (0.05) between (foot length, width, receiving and diagonal smash shots) the counted (R)

value is between (0.012-0.176-0.090-0.202) and these are less than the scheduled value (0.444) the researcher found that these measurements are not related to performance in receiving and smash shots as they depend on the player's ability to control arms, trunk with the needed power to achieve comprehensive performance which is affected by feet length and width.

5. CONCLUSIONS:

- There is a significant correlation between foot length and transitional speed test.
- There is a significant correlation between foot length, transitional speed test and agility.
- There is no significant correlation between foot length, width, explosive power test and balance.
- There is no significant correlation between foot length, width, receiving serves and diagonal smash shots.

Recommendations

Upon previous conclusions, the researchers recommend the following:

- While choosing female volleyball players, they should distinguish feet length and width.
- There should be similar studies to individual and group sports in Iraq with comparing their results with the study results.

6. REFERENCES:

1. Abo- Alola Ahmad and Naser Al- deen Radwan, The Physiology of Body Ability, Dar Al- Fiker Al- Arabi, Cairo (1992).
2. Daia'a Thamir Muttar Al- Shaibani, The Affection of Training Course by Using Helping Aid in Developing The Speedy Power for The Young Basket Ball Players, Issued Research- Al- Qadesiyah Magazine, vol.11, Number.3,(2011).
3. Qais Naji and Bastawessi Ahmad, (Tests and Measurement and Principles of Statistic in the Sportial Field), University of Baghdad Press, (1984).
4. Muhamad Abdul Hameed Billal, The Affection of The Electrical Polymetric The Basic Principles of Basket Ball, P. H. D thesis, College of Physical Education, Al- Xendria University ,(2000).
5. Mohamad Othman, Track And Field Encyclopedia, Dar Al- Fiker Al- Arabi, Kuwait, (1990).
6. Muhamad Subhi Hussain, Measurement in Physical Education, Dar Al- Ma'aref, Cairo, (1984).
7. Raja'a Mohmood Abo A'alam , Research Courses in The Educational and Phsycologic Sciences, Dar Alnnasher Ielgameaat, Cairo, (2004).
8. Sawsan Takwee, "The Affection of using the Rubber Rops inside The Water on The Body Abilities", Al- Bahrain (2005).
9. Shafiq Al- Atoum – Methods of Statistics in The Economical and Administrative Applications (SPSS), Dar Al- Manaheg for Issuing and Distribution , Amman, Jordan (2006).
10. Sareeh Abdul Kareem Al- Fadhli, (International Association of Athletic Federation- Competions Rules), translate and prepration, (2011).
11. Sareeh Abdul Kareem Al- Fadhli , (The Affection of The Changeable Resisting in Improving The Ability of The Legs Muscles), Issued research , Baghdad – vol. 1, Mage. 12 , (2003).
12. Tariq Nazar Al- Talib, (The Affection of Using The Rubber Rops in
13. Technical Gymnastic for Men), Issue

Address for correspondence

Authors : Nowzad Hussien Darwish – Physical Education School, Koya University