

## The Characteristics of Nutritional Habits of Junior Wrestlers in the National Teams Participating in African Nations Championship Qualifying for the 2014 Olympics in China.

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### Abstract

*Nutritional programs for athletes are not less important than the training programs. In a certain stage sounds nutritional programs maybe more important than the training programs, especially in some sports which require specific weights such as wrestling. Importance of nutritional programs is also obvious for athletes in camps and before, during and after competitions. It also helps contribute to overcome stresses and recover whether from overload or injuries. Nutritional habits and practices must therefore be introduced as an element of training program. Nutrition awareness of athletes affects the development of eating habits because they play an important role in determining their health condition. It also guides the planning process to feed athletes during the training season. It can be a scientific foundation complementing the training process in wrestling and organizing and guiding the training programs developed for wrestlers. Through this study, the researchers seek to identify the main determinants through which the food habits can be identified for junior wrestlers in National teams participating in the African Nations championship because they have an effective role to play in guiding the training process, and especially the food habits of wrestlers of the national teams winning the first three positions. The sample consisted of 54 wrestlers distributed as follows: 29 wrestlers from national teams winning the first to third positions in the African Nations Championship of junior wrestlers qualifying for the China Olympics of 2014 and 25 wrestlers from national teams winning the fourth to the last positions. The main results showed excellence of players of the teams winning the top positions (the first three) in most food habits. Axes of food habits came in this order: habits related to supplementary foods, habits related to nutrition, sport injuries and training environment, habits related to nutrition for recovery after physical effort, habits related to the general concepts of nutrition, habits related to nutrients, habits related to balanced food and nutritional needs and habits related to planning meals. Recommendations included using the determinants of food habits found by this study as an important and useful factor in guiding the training process and upgrading the achievement level; Providing the scientific committee of the international and Egyptian Wrestling Federation with the results of this study for use and application; putting food education programmes in place for wrestlers and wrestling trainers.*

### Introduction:

**T**here is no doubt that the nutritional programs of athletes are less important than the training programs. In a certain stage sounds nutritional programs maybe more important than the training programs, especially in some sports which require specific weights such as wrestling. Importance of nutritional programs is also obvious for athletes in camps and before, during and after competitions. This all should be done under supervision and by a nutritionist so that the technical training processes are translated into results and levels achieved by athletes. (20:101) (18:25) (4:54)

Nutrition system also has a direct impact on sport performance, training and competition. It also helps contribute to overcome stresses and recover whether from overload or injuries. Nutritional habits and practices must

therefore be introduced as an element of training program. (10:28) (16:74) (25:241)

An athlete's need for food is closely related to the body's needs so that it can perform the biological function, activities and daily jobs efficiently because the appropriate food has a qualitative and quantitative effect of the nutrition and health for an athlete, and improves the sports performance level. (3:24) (17:170) (5:235)

Studies on the subject have proved that a nutrition sportsperson must be the same nutrition recommended for the normal (non-sportive) person, taking in the consideration that it provides for his/her additional burdens required by physical activity, so that he/she will have the energy required for his/her needs through the essential nutrients. This should be done in each training session and competition and after competitions bearing in mind the fact that the amount of energy or the daily needs for the nutrient differ according to age, gender, weather,

intensity of physical activity or effort and the health condition of athletes. (3:320) (23:82-87)

An athlete's diet must be balanced taking into consideration the fact that the meal components are related to the different nutritional needs and the athletes, personal food habits. (12:258) (3:321) (21:342)

Previous studies have always proved that sound nutritional habits are closely related to a high performance level whether in training or competition because the sound nutritional programs lead to a high performance level in sport. (19:190) (8:135) (13:148)

Wrestling, in particular is governed by weights and accordingly it sometimes requires loss of weight especially before competition. This is, however, done in a hazard manner without following a proper sport nutrition program and the practice of wrong food habits. Wrestlers lose some kilograms to compete in a lower weight category, which often leads to dehydration because the body loses water as a result of taking diuretics or by intensive sport activity, which negatively affect the performance level during competition. (19:216) (11:222) (24:956)

Since trainers are the principal source of food programs for players, lack of information about nutrition would negatively affect the standard of the players and vice versa. (8:134) (6:5)

Nutrition awareness of athletes affects the development of eating habits because they play an important role in determining their health condition. It also guides the planning process to feed athletes during the training season which contributes to determining the nutrition status and the general health standard of athletes. (1:3) (8:113) (9:537)

It is difficult to change wrong food habits except through long years. By raising awareness and spreading the correct food culture individuals can be directed towards making up balanced diets and obtaining knowledge about food alternatives. (1:3)

Traditions and beliefs also affect individuals' food. The mind often plays a big role in deciding an individual's needs of particular food items. These are associated to the method of bringing up a person and the surrounding circumstances and the outer influences such as the advertisements. If a person is used to eating one particular food item as a child, he/she will be able to eat it at any time. (18:53)

Food habits of athletes can be developed in an appropriate manner. The development of food habits, individually and collectively, can be measured by assessing individual food

development through self-assessment, thus teaching a person how to conduct a quick mental evaluation of each meal and each food item consumed and relating them to some important variables such as the nutritional value of the food consumed and the adequate food elements consumed by the body. (18:31)

In order for the ideal nutrition for athletes to be achieved, several principals decided by dietetics or the branch of knowledge which studies nutrition. The main principals are:

- Following an integrated and balanced diet taking into consideration the quantity and quality of the food consumed, related to the requirements of training or competitions. Foods with excessive protein, carbohydrates or fats should be avoided. Additional dosages of vitamins and minerals must also be avoided unless prescribed by sport nutrition specialist. Quantities of food with such components should not be less than required by training and competition because this may affect the health condition of the sports person.
- The principal of taste in nutrition must be applied endeavoring not to disturb the principal of food balance, because caring only for tasting the food is not sufficient to achieve ideal nutrition. Eating many foods according to the liking and tasting sense of athletes may cause them troubles that may affect their health and negatively affect the level of their performance. A balance must therefore be kept between nutrition and tasting in order for the athletes to be healthy and to have a sound psychological condition which is always affected by deprivation from food the intend to like.
- Taking into consideration the established percentages of the basic components of athletes' meals. (3:321)

Based on the above, this present study can be a scientific contribution providing information on food habits characteristic for junior wrestlers in National teams participating in the African Nations championship. It can be a scientific foundation complementing the training process in wrestling and organizing and guiding the training programs developed for wrestlers and also to follow up International achievements of championships.

Through this study, the researchers seek to identify the main determinants through which the measure food habits can be identified for junior wrestlers in National teams participating in the African Nations championship because they have an effective role to play in guiding the training

process as an essential and important indicator helping to upgrade the training process.

**Research objective**

This research aims at identifying (copy research title)

**Research assumption**

Based on the research objective, the research assumption was identified as follows: there are statistically significant differences in food habits between distinguished national teams' wrestlers winning one to third positions and non-distinguished national teams' wrestlers.

**Research procedures**

**Methodology**

The descriptive method was used, being suitable for the type and objective of the research.

**Research scopes**

Geographical scope:

The study was conducted in the hall of the Military Olympic Center of Alexandria, Egypt.

Time scope:

The study was conducted in the period 19/5/2014 – 23/5/2014.

**Research sample**

The research sample was selected in a non-random manner from wrestlers of the national teams participating in the African Nations Championship of junior wrestlers qualifying for the China Olympics of 2014. The sample consisted of 54 wrestlers distributed as follows:

29 wrestlers from national teams winning the first to third positions in the African Nations Championship of junior wrestlers qualifying for the China Olympics of 2014 (national teams of Egypt, Algeria and South Africa).

25 wrestlers from national teams winning the fourth to the last positions in the African Nations Championship of junior wrestlers qualifying for the China Olympics of 2014 (national teams of Tunisia, Morocco, Cote de Voire, Angola and Mauritius).

**Data collecting tools**

A questionnaire was used as a principal tool of collecting data and information, through which food habits of national teams' wrestlers can be identified. The questionnaire consists of 8 axes. Table 1 shows the total and actual statements, the number of positive and negative statements and the statements deleted from each axis of food habits.

Table 1

Positive and negative statements, deleted statements and the total actual statements in each axis of food habits

Sr .	Axis	Number of statements				
		Positive	Negative	Excluded	Total	Actual total
1	Habits related to the general concepts of nutrition	11	4	2	17	15
2	Habits related to nutrient	12	2	2	16	14
3	Habits related to planning meals	9	1	1	11	10
4	Habits related to balanced food and nutritional needs	10	-	2	12	10
5	Habits related to supplementary foods	9	-	2	11	9
6	Habits related to malnutrition	3	7	1	11	10
7	Habits related to nutrition for recovery after physical effort	7	-	2	9	7
8	Habits related to nutrition, sport injuries and training environment	9	1	2	12	10
Total		70	15	14	99	85

**Scientific coefficient of the questionnaire**

The scientific coefficient of the questionnaire (validity - reliability) was calculated

*I- Validity*

Validity was calculated by finding (content validity)

Sources of related studies were listed, reviewed and analyzed. Reference books and articles related to the research subject and information on the internet were also reviewed. Although a few studies only related to the research subject are

available, axes and form statements were designed in such a manner as to be closely related to the research subject regarding their suitability to measuring the research subject.

*II- Reliability*

Reliability was found by applying the Alpha Chrombac coefficient.

Reliability was found by calculating the Alpha Chrombac coefficient of the statements used in food habits axes

Table 2  
The Alpha Chrombac coefficient of the statements used in food habits axes (N=54)

Sr.	Axis	The Alpha Chrombac coefficient
1	Habits related to the general concepts of nutrition	0.661
2	Habits related to nutrient	0.680
3	Habits related to planning meals	0.745
4	Habits related to balanced food and nutritional needs	0.705
5	Habits related to supplementary foods	0.763
6	Habits related to malnutrition	0.581
7	Habits related to nutrition for recovery after physical effort	0.698
8	Habits related to nutrition, sport injuries and training environment	0.662

Table 2 on Alpha Chrombac coefficient of questionnaire axes (on food habits) shows that the Alpha Chrombac coefficient varied between 0.581 and 0.763, this value is high for an Alpha Chrombac coefficient, thus proving that the statements used in axes of food habits are homogenous, and that the statements are part of the structure of the axes, and also that deleting or adding any

statement in the axes may have a negative effect on the structure of axes.

**Normalcy of variable distribution (data)**

In order to make sure that the sample is free from any defects in the normal distribution, the mean, the standard deviation, coefficient of contortion, kurtosis of the sample were found for the axes of the food habits as follows.

Table 3  
The mean, the standard deviation, coefficient of contortion, kurtosis of the sample were found for the axes of the food habits

Sr.	Axis	Mean	Standard deviation	Coefficient of contortion	Kurtosis
1	Habits related to the general concepts of nutrition	23.81	1.64	-0.440	-0.517
2	Habits related to nutrient	23.41	2.08	0.28	-0.621
3	Habits related to planning meals	17.28	2.16	-0.245	-1.096
4	Habits related to balanced food and nutritional needs	18.02	1.80	-0.556	-0.565
5	Habits related to supplementary foods	14.50	2.30	-0.518	-0.774
6	Habits related to malnutrition	16.69	2.40	-0.352	-0.314
7	Habits related to nutrition for recovery after physical effort	12.00	1.75	-0.196	0.02
8	Habits related to nutrition, sport injuries and training environment	16.46	2.00	-0.373	0.63

Table 3 shows that axes of food habits for sample subjects follow the normal frequency distribution (normal curve), with a skew coefficient of 0.556 - 0.28, i.e., no higher than  $\pm 3$ . This is a direct indication that the sample represents a normal population and that it is free from non-normal distributions.

**The Basic Study**

- The study was conducted on the research sample during the African Nations Championship of junior wrestlers qualifying for the China Olympics of 2014, organized in the period in the

period 19/5/2014 – 23/5/2014 in the Military Olympic Centre of Alexandria, Egypt.

- The following steps were taken to conduct the study:
- The questionnaire form was translated from Arabic into English and French so that wrestlers from the national teams participating can understand and answer the questions.
- Approval of technical and administrative staff of teams participating in the championship to conduct the study on the players was obtained.
- The questionnaire forms were distributed to players in each national team, explaining the method to be followed in answering the questions contained in the form.

- The questionnaire forms were collected in the days following distribution of the same.
- Data was written down and statistical treatment was conducted to reach conclusions.

**Statistical treatments**

The following statistical treatments were conducted to realize research objectives and assumptions:

- The mean
- Standard deviation
- Skew coefficient
- Kurtosis
- Discriminan analysis
- Choronbach's alpha

**Results presentation and discussion**

Table 4

Mean, standard deviation, the F value for food habits to compare distinguished and non-distinguished junior wrestlers and the Wilk'slambada value and the anova F value N=54

Sr.	Statistical significance  Food habits axes	Distinguished teams		Non-distinguished teams		Total		Wilk'slambada	Anova F value	Significance level
		Mean	±std deviation	mean	±std deviation	mean	±std deviation			
1	Habits related to the general concepts of nutrition	24.34	1.23	23.20	1.85	23.81	1.64	0.88	7.35	0.01
2	Habits related to nutrient	23.97	2.03	22.76	1.98	23.41	2.08	0.92	4.84	0.03
3	Habits related to planning meals	17.59	2.08	16.92	2.23	17.28	2.16	0.98	1.29	0.26
4	Habits related to balanced food and nutritional needs	18.34	1.56	17.64	2.00	18.02	1.80	0.96	2.11	0.15
5	Habits related to supplementary foods	15.69	1.87	13.12	1.96	14.50	2.30	0.68	24.16	0.00
6	Habits related to malnutrition	16.93	2.20	16.40	2.63	16.69	2.40	0.99	0.65	0.42
7	Habits related to nutrition for recovery after physical effort	12.79	1.26	11.08	1.80	12.00	1.75	0.76	16.71	0.00
8	Habits related to nutrition, sport injuries and training environment	17.48	1.64	15.28	1.72	16.46	2.00	0.69	23.16	0.00

Table 4 shows the mean, and standard deviation of distinguished and non-distinguished junior wrestlers and the Wilk'slambada value and the anova F value. Based on Wilk'slambada test and the F test of differences,

comparison between distinguished and non-distinguished junior wrestlers revealed excellence of distinguished wrestlers in axex of food habits

Table 5

Order of incorporating axes of the deduced food habits between distinguished and non-distinguished junior wrestlers in the discriminant analysis equation and direction, and the Wilk's lambada value of addition and the F value of the significance of addition

Sr.	Statistical significance Axes of the deduced food habits	Wilk's lambada test value	F value
1	Habits related to supplementary foods	0.68	24.16
2	habits related to nutrition, sport injuries and training environment	0.69	23.16
3	Habits related to nutrition for recovery after physical effort	0.76	16.71
4	Habits related to the general concepts of nutrition	0.88	7.35
5	Habits related to nutrients	0.92	4.84
6	Habits related to balanced food and nutritional needs	0.96	2.11
7	Habits related to planning meals	0.98	1.29

- Latent root 1.190
- Final Wilk's Lambada test 0.457
- Collective coefficient of correlation 0.73
- Equivalent K2 Square value 37.625
- Percentage of covariance 100%

of variables and finding the best synthesis of significant axes of food habits. The aim was to ensure isolation of the criterion of excluded variables, then of selected variables. The table shows the main food habits placed in order of inclusion (habits related to supplementary foods, habits related to nutrition, sport injuries and training environment, habits related to nutrition for recovery after physical effort, habits related to the general concepts of nutrition, habits related to nutrients, habits related to balanced food and nutritional needs and habits related to planning meals).

Data in table 5 of incremental analysis, reflecting axes of food habits in order of importance, shows direction and Wilk's lambada test value of significance of addition and significance level of incremental multiple regression by introducing variables progressively while using the Wilk's Lambada test to control the progressive introduction

Table 6

Coefficients of the standard and non-standard discriminant functions and the fixed values of food habits axes for distinguished and non-distinguished junior wrestlers of national teams in order of inclusion

Statistical treatments		Non-standard equation fixed values	Standard equation fixed values
Deduces axes of food habits			
1	habits related to the general concepts of nutrition	0.321	0.207
2	habits related to nutrients	0.073	0.037
3	habits related to planning meals	0.01	0.005
4	habits related to balanced food and nutritional needs	0.089	0.05
5	habits related to supplementary foods	0.446	0.233
6	habits related to nutrition for recovery after physical effort	0.42	0.274
7	habits related to nutrition, sport injuries and training environment	0.604	0.36
Constant amount value		-	18.312-
equivalent of the discriminant function for the mean of the group in the non-standard equation: - first group (distinguished junior wrestlers) 0.994 - second group (distinguished junior wrestlers) 1.153-			

Table 6 shows coefficients of standard and non-standard discriminant functions, constant values of axes of food habits for distinguished and non-distinguished junior wrestlers of National teams which evaluate the current status of distinguished and non-distinguished junior

wrestlers of National teams and the improvement of food habits, in the light of which a guide model of food habits can be developed where preferences are made to build up the guide model

Table 7

Results of using discriminant function in re-classification of distinguished and non-distinguished junior wrestlers of National teams (study sample)

Group	Characteristics	First total	Second total
Distinguished wrestlers	Number of samples	4	25
	Classification percentage	3.8%	86.2%
Non-distinguished wrestlers	Number of samples	6	19
	Classification percentage	24%	76%

Percentage of equation success in selection and classification is 81.5%.

**II- Discussion of results**

Table 4 shows the mean and the standard deviation of distinguished and non-distinguished junior wrestlers of National teams and Wilk'slambada test and the ANOVA F value. Distinguished National teams wrestlers excelled in most of the food habits axes when comparing distinguished and non-distinguished junior wrestlers of National teams through Wilk'slambada test and the F test of differences between the two groups.

Citing Omar,M,(15) states that Wilk'slambada test is an ANOVA test for each of the two groups. These two tests are called Wilk'slambadaand it refers to percentage of variance within the groups for the grand total of variants. Thus table 4 shows significant differences between junior wrestlers of national teams in most of the food habits.

Data in table 5 on the incremental analysis shows the measurements of axes of food habits in order of importance. It also shows the direction and the value of Wilk'slambada test for the significance of addition and the level of the significance for the incremental multi-regression by using the method of introducing variables progressively while applying the Wilk'slambada test to control the stages of including food habits and finding the best synthesis of the measurements of axes of statistically food habits.

The multiple statistical methods in analyzing discrimination was used to choose the first variables which contain the largest amount of the chosen criterion, the other variables are evaluated to choose the variable which makes from the first variable the largest amount of established criterion whether by addition or isolation where the variables are re-evaluated within the equation to determine whether the isolation equation has been

achieved, if it achieves the isolation criterion it will be isolated and so force with the unselected variable then with the selected variables.

A review of table 5 shows that the main measurements of food habits in order of its importance are habits related to supplementary foods, sport injuries and training environment, habits related to nutrition for recovery after physical effort, habits related to the general concepts of nutrition, habits related to nutrients, habits related to balanced food and nutritional needs and habits related to planning meals.

Murphy, et al stress the importance of assessing the nutritional needs of players because insufficient food needs and not following the correct food system (diets) proportional to each sport activity will have a negative effect on the health of player and on achieving high sport levels. (14:273-278)

Balanced nutrition is an important component in the sports training program because training and nutrition are two essential elements which help player excel. Nutrition of the athlete can be viewed from two points: nutrition for competition and nutrition for training. (8:123)

This has been proved by studies ever since sports nutrition was a point of interest. Good food habits are closely to an increase in the performance level whether in training or competition because the sound or the correct food programs increases the glycogen stored in the body by taking up sufficient amounts of carbohydrates. Taking up vitamins and minerals also provides the best performance of the internal body system which is in turn reflected on sports performance. (8:135)

Burke states that the sports program of any kind must always takes into consideration the health condition of the player and the quality and quantity of food eaten by the players besides the nutritional value of the food which

contributes developing the physical fitness and the kinetic and tactical skills (7:88)

In correct nutrition with the major factor which limits the player's ability and stops him from reaching his maximum potential, unfortunately many players do not reach their maximum physical and motor potentials, because of insufficient awareness or because they are not made aware of the relationship between sport performance and food. (2:27)

This conforms to the study by VintiDavar who stated that athletes who lack information of food do not choose healthy food or know the balanced diet and the negative effects of eating unhealthy food, all of this will have an effect on the physical performance level of athletes. This study recommended conducting training sessions or educational subjects which encourage the acquisition of knowledge and healthy food attitudes among athletes. (22:119-124)

AlaaEddinElewa also suggested that healthy nutrition means developing sound food habits as a result of spreading the correct nutrition awareness and also because wrong customs and habits concerning food play an important role in the deterioration of the health condition of individuals and in catching some mal-nutrition diseases because eating excessive food leads to obesity and an increase in body weight, and under-nutrition leads to leanness and under-weight. (8:113) he also states that trainers are the principal source of food programs for most players, which means that lack of knowledge of nutrition among trainers will have a negative effect on the player's level. (8:134)

Burke suggests that the important knowledge which the trainer and the player must have in sport, and especially in sport training, is how to choose the kind of food and the nutritional value and the best time the athlete must eat food and how this is related to physical loads during training and competition. (7:86)

This shows how important these measurements of food habits are for national teams. They are important and essential indicators which can distinguish one national team from another according to determinants which are related to their food habits as illustrated by the collective correlation (0.73) which shows a high possibility of classification using these measurements.

Table 6 shows standard and non-standard discriminant function coefficient, and the values of the constant measurements of food habits axes for distinguished and non-distinguished junior wrestlers of national teams which shows the current status of junior wrestlers winning the top positions in the African championship, and the amount

of discrimination and improvement of food habits in the light of which information can be added about determinants and special indicators of food habits which can be a scientific foundation to guide the training process in wrestling. And also in studying training adaptations and an indicator which help control, organize, and guide the training programs of wrestlers and upgrading them to international and world levels, in the light of these measurements after preferences are made which show the importance of food habits.

Table 7 shows the results of using the discriminant functions in re-classifying distinguished and non-distinguished junior wrestlers of national teams participating in the African championship as the percentage of equation success in prediction and classification is 81.5%.

### Conclusions

Based on the results reached by the researchers and within the framework of the statistical treatments used, the following conclusions were made:

- Players of national teams winning top positions (the first three positions) were distinguished in most food habits. Axes of food habits, in order of importance, were as follows: habits related to supplementary foods, sport injuries and training environment, habits related to nutrition for recovery after physical effort, habits related to the general concepts of nutrition, habits related to nutrients, habits related to balanced food and nutritional needs and habits related to planning meals.

### Recommendations

Based on the conclusions reached and the procedures followed, the following recommendations were made:

- The determinants of food habits found by this study should be used as an important and useful factor in guiding the training process and upgrading the achievement level;
- Food education programmes should be in place for wrestlers and wrestling trainers;
- Raising awareness among wrestlers about the importance of food habits as an important factor that affects the success of the training process;
- Trainers should be advised to take notice of the latest trends in the field of nutrition of athletes during the training season, and should also be provided with food information compatible with

the developments in the training process and in sport nutrition;

- Developing regular tests for wrestlers to evaluate food habits during the difference stages of the sport season;
- Providing the scientific committee of the international and Egyptian Wrestling Federation with the results of this study for use and application;
- Applying the suggested food habits questionnaire in other sports activities;
- Conducting further scientific research on food habits and sports nutrition in other sports activities and on different age groups of players and trainers.

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