



Assessment of The Nutritional Status and Dietary Pattern of Martial Art Exponents

KEYWORDS

Martial arts, Nutrition, dietary pattern, chronic diseases.

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ABSTRACT *Martial arts are systems of codified practices and traditions of training for combat. By focusing on the quality and quantity of food and balanced consumption of carbohydrates, proteins, fats, minerals, vitamins and supplements, a practitioner hopes to enhance his or her performance. Successful martial arts nutrition can lead to improved body chemistry for balance, explosive power, better mobility, higher endurance for sport and self-defense situations, speedier recovery times, strengthened immune systems and maintenance of a healthy body weight. Hence, this study will enable us to elicit information on the demographic profile, anthropometric, biochemical, clinical parameters and dietary pattern of the martial art exponents and at the same time the nutritional assessment will give us a bird's eye view of the possibilities of chronic diseases among the subjects and their dietary habits in depth. The results of the study revealed that majority the martial artists belonged to the age group of 20-25 years, and are graduates. Most of them do not have any chronic diseases. Data pertaining to the nutritional status revealed that the karate martial artists were overweight, the mean body fat percentage was higher, and the blood pressure levels were slightly elevated among the Karate martial artists compared to other martial arts exponents. The mean energy intake of the martial art exponents for the five different styles namely Karate, Taekwondo, Wushu, Kungfu and Judo ranged from (2038±337g) to (1870±366g). This study helped to understand the importance of nutrition for martial art exponents.*

Introduction

The major importance of this study is to expound on the basic fitness levels and the nutritional significance of the martial art personalities. Globally, the prevalence of chronic, non-communicable diseases is increasing at an alarming rate. The prevalence of a number of nutritional deficiencies, chronic medical diseases has also increased substantially in the nutritional transition countries. Through a general nutritional assessment of the martial artists the study will truly depict the overall profile of the martial artists. Generally, the basic necessity for the martial art exponents includes a high protein supplement which helps them gear up their physiological status during pre and post bouts. Nutrition for martial artists deals with diet and a good nutrition to positively affect a practitioner's performance. The first main objective of this study is to elicit information on the demographic profile, personal habits and food frequency pattern of Martial Artists, to assess the nutritional status of all the subjects using anthropometric measurements, fasting plasma glucose levels, clinical parameters and dietary pattern of all the martial artists. Secondly to analyze the selected biochemical parameters- serum lipid profile for Karate Martial Artists, to standardize and assess the sensory and nutrient content of the newly developed high protein beverage for Martial Artists. Successful martial arts nutrition can lead to improved body chemistry for balance, explosive power, better mobility, greater speed and strength, increased energy for intense workouts, higher endurance for sport and self-defense situations, speedier recovery times, strengthened immune systems and maintenance of a healthy body weight. An adequate diet comes from eating a variety of foods from the four food groups (NIN, 2011). The newly formulated high protein beverage contains whey protein, soaked almonds, sugar and fruits, this boosts the protein content and serves as a delicious and satisfying snack or meal which can be made in no time. They can quickly turn into a high-protein dessert that is of nutritional benefit. Hence, this study will enable us to elicit information on the demographic profile, anthro-

pometric, biochemical, clinical parameters and dietary pattern of the martial art exponents and at the same time the nutritional assessment will give us a bird's eye view of the possibilities of chronic diseases among the subjects and their dietary habits in depth.

Materials and Methods Objectives of the Study

1. To elicit information on the demographic profile, personal habits and food frequency pattern of Martial Artists.
2. To assess the nutritional status of all the subjects using anthropometric measurements, clinical parameters and dietary pattern of all the martial artists.
3. To analyze the selected biochemical parameters for Karate Martial Artists

The present investigation was undertaken to assess the nutritional status of sixty martial art exponents each of five different styles namely, Karate, Taekwondo, Wushu, Kungfu and Judo. A purposive sampling technique was used to select sixty martial artists from five different styles of martial arts (12 subject each style). The nutritional assessment involved determination of the relevant anthropometric measurements, fasting plasma glucose levels, clinical parameters which includes blood pressure levels and dietary assessment was done using a 24-hour dietary recall method and was followed for three non-consecutive days which included two weekdays and one week end for all the subjects and selected biochemical parameters like serum lipid profile was assessed for the Karate martial artists.

Design of the study includes martial artists from five different styles in (Karate, Taekwondo, Wushu, Kungfu, judo) were selected for the study and general information regarding demographic profile, personal habits, exercise pattern, family history of diseases were elicited using an interview schedule. The nutritional status of the martial artists was assessed using anthropometric measurements which

included the height, body weight, waist circumference, hip circumference, waist-hip ratio, body fat and thereafter the BMI and waist hip ratio was calculated. Selected biochemical parameters such as serum lipid profile and fasting blood glucose were analyzed for Karate martial artist. The dietary assessment was assessed for all the martial art exponents using 24-hour dietary recall method and was repeated for three non-consecutive days which included two weekdays and one week end. General nutritional counseling was given on the importance of balance diet to all the subjects at the end of the study period. The martial artists were selected based on their technical exposure to their own respective style and their willingness to participate in the study.

Results and Discussion

The data regarding demographic details, dietary habits and physical activity were collected using an interview schedule. The data was processed, tabulated and subjected to descriptive analysis.

General Information

The demographic profile of the subjects revealed that majority (83%) of the Kungfu martial artists, 75 per cent of the Judo martial artists, 58 per cent of the Taekwondo martial artists and 50 per cent of the Wushu martial artists belonged to the age group of 20-25 years and 75 per cent of the Karate martial artists belonged to the age group of 25-35 years. Data pertaining to number of years practicing the art by the subjects revealed that 41 per cent of the taekwondo martial artists, 33 per cent of the Judo martial artists are practicing the art for more than 10 years. Results pertaining to purpose of practicing the art showed that 41 per cent of the subjects practice karate as a physical activity whereas 33 per cent for self defence. Results indicate that Karate martial artists indulge in some form of intense workouts. Fifty per cent of them indulge in beach practice, 33 per cent in stamina exercise, 16 per cent in hill practice and none of the martial artists are involved in road running practice. Results pertaining to history of chronic illness revealed that majority (91%) of the Taekwondo and Wushu martial artists do not have any chronic diseases. Forty one per cent of the Kungfu martial artists, 33 per cent Judo martial artists, 16 per cent of the Karate martial artists have a history of hypertension. Data pertaining to family history of disease condition revealed that majority (25%) of the Judo martial artists had a strong family history of diabetes followed by heart diseases (16%) and hyperlipidemia (16%).

Results pertaining to type of diet revealed that majority (91%) of the Kungfu and Judo martial artists, 75 per cent of the Wushu martial artists, 58 per cent of the Taekwondo martial artists, are non-vegetarians, 25 per cent of the Taekwondo martial artists were lacto-vegetarian and the others were vegans. Data pertaining to knowledge about ergogenic aids revealed that all the karate martial artists, 91 per cent of the taekwondo martial artists and 66 per cent of the Wushu, Kungfu and Judo martial artists use mechanical ergogenic aid and the rest do not use any other ergogenic aids

Food Frequency

The food frequency pattern revealed that all the subjects consumed rice and wheat daily. Vegetables like onion, carrot, tomato and beans were consumed by the subjects on a daily basis. Fruits were consumed occasionally by the subjects. Fish, meat and poultry were consumed weekly. Milk was also consumed by all the subjects on a regular basis

Anthropometric Measurements

Mean height, body weight and body mass index, waist circumference, hip circumference, waist-hip ratio and body fat are presented in the table.

Particulars	Types of Martial Arts n=60				
	Karate (n=12)	Taekwondo (n=12)	Wushu (n=12)	Kungfu (n=12)	Judo (n=12)
Height(cms)	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
	171±5	168±8	169±6	169±9	170±6
Body Weight(kgs)	73±10	68±7	58±8	67±11	67±11
Body Mass Index (kg/m ²)	25±4	22±2	20±3	24±2	23±3
Waist Circumference (cms)	101±3	93±2	91±2	91±3	96±3
Hip Circumference (cms)	86±2	81±2	81±2	86±2	83±2
Waist -Hip Ratio	1.17±1.4	1.14±1	1.12±1	1.05±1.4	1.15±1.4
Body Fat	21±5	19±5	15±5	18±4	18±5

The mean height of the Karate martial artists (171±5cms) was highest and lowest was found in the Taekwondo martial artists (168±8cms). It is found that Karate martial artists (73±10 kgs) had higher mean body weight and the lowest was among the Wushu martial artists (58±8kgs). Data pertaining to the nutritional status revealed that the karate martial artists had a BMI of (25±4 kg/m²) which is regarded as overweight and the BMI is comparatively higher than the other martial arts exponents. The lowest BMI (20±3 kg/m²) was seen in the Wushu martial artists. The mean waist circumference was highest in the Karate martial artists (101±3 cm) and lowest in the Wushu martial artists (91±2 cm). The mean hip circumference was highest in the Karate and Kungfu martial artists (86±2 cm) and the lowest was seen in the Taekwondo and Wushu martial artist (81±2 cm). The mean waist to hip ratio was highest among the Karate martial artists (1.17±1.4cm) and lowest among the Wushu martial artists (1.05±1.4cm). The mean body fat percentage was higher among the Karate martial artists (21±5) that was slightly above the ideal cut off level.

Biochemical Assessment

Biochemical assessment like fasting blood glucose levels was done for all the martial artists. The blood samples from the subjects were collected and examined.

Fasting Plasma Blood Glucose Levels

The mean values of fasting plasma blood glucose levels of the subjects is given in table

Mean Fasting Plasma Blood Glucose Levels of Martial Artists Exponents

Particular	Types of Martial Arts n=60				
	Karate (n=12)	Taek-wondo (n=12)	Wushu (n=12)	Kungfu (n=12)	Judo (n=12)
Fasting Blood Glucose level (mg/dl)	Mean±SD 91±11	Mean±SD 94±5	Mean±SD 93±11	Mean±SD 89±9	Mean±SD 92±5

Data pertaining to mean fasting plasma glucose level was highest among the Taekwondo (94±5mg/dl) followed by Wushu (93±11mg/dl), Judo (92±5mg/dl), Karate (91±11mg/dl) and Kungfu (89±9mg/dl) martial artists. In general all the martial artists had fasting glucose level well within the normal values. Martial arts begin high intense physical activity, it has an important role to play in the raise and drop levels of fasting plasma glucose levels, as the results show that the levels are well within the normal range it indicates that the risk of developing chronic diseases like Diabetes Mellitus and Heart Diseases are to a lower extent. In addition the complications associated with raise in fasting plasma blood glucose levels like Diabetes, hyperglycemia and hypertension could also be reduced.

Clinical Assessment

Blood Pressure levels (mmHg)	Types of Martial Arts n=60				
	Karate (n=12)	Taekwondo (n=12)	Wushu (n=12)	Kungfu (n=12)	Judo (n=12)
Systolic Blood Pressure	Mean±SD 135±9	Mean±SD 130±16	Mean±SD 125±7	Mean±SD 118±12	Mean±SD 124±14
Diastolic Blood Pressure	84±10	79±4	79±4	84±7	82±4

Data pertaining to blood pressure levels of the martial artist revealed that the mean systolic blood pressure level and diastolic blood pressure level for the Karate martial artists was 135±9mmHg and 84±10mmHg. The lowest was among the Kungfu martial artists, the mean systolic blood pressure level and diastolic blood pressure level was 118±12mmHg and 84±7mmHg.

Dietary Assessment

Nutrients	Types of Martial Arts n=60				
	Karate (n=12)	Taek-wondo (n=12)	Wushu (n=12)	Kungfu (n=12)	Judo (n=12)
Energy (Kcal)	Mean±SD 1959±355	Mean±SD 2038±337	Mean±SD 2074±366	Mean±SD 1870±366	Mean±SD 2009±346
Carbohydrate (g)	276±41.4	289±57	280±41	264±54	285±50
CHO Percent (%)	56	57	54	56	54
Protein (g)	64±14	67±13	65±15	59±16	66±15

Protein Percent (%)	13	13	13	13	13
Fat(g)	66±18	67±11	75±18	63±16	68±14
Fat Percent (%)	30	30	33	30	30
Saturated fatty acid (g)	32±11	33±62.15	39±12.48	32±97.77	33±95.01
Saturated fatty Acid percent (%)	48	49	52	50	48
MUFA (g)	23±63.50	23±42.98	26±59.79	22±52.31	24±50.64
MUFA Percent(%)	35	34	35	35	35
PUFA (g)	11±30.70	11±22.58	10±23.58	10±20.9	11±20.36
PUFA percent (%)	16	16	13	16	16
Cholesterol (mg)	160±95	156±49	191±109	150±92	158±91
Vitamins(mg)					
Vitamin A (µg)	2±1	2±1	1±0	1±0	2±1
Thaimine (mg)	2±0	2±0	2±0	2±0	2±0
Riboflavin (mg)	1±0	1±0	1±0	1±0	1±0
Minerals (mg)					
Calcium (mg)	828±210	884±214	860±198	759±167	821±159
Iron (mg)	19±4	20±3	19±3	17±4	19±4

The mean energy intake was highest among the Wushu martial artists (2074±366Kcal) and lowest among the Kungfu martial artists (1870±366 Kcal). The mean carbohydrate intake was highest among the Taekwondo martial artists (289±57g) and lowest among the Kungfu martial artists (264±54g).

The mean protein intake was highest among the Taekwondo martial artists (67±13g) and lowest among the Kungfu martial artists (59±16). The protein percentage was (13.15%) among the Taekwondo martial artists and (12.62%) in Kungfu martial artists. The mean fat intake was highest among the Wushu martial artists (75±18g) and lowest among the Kungfu martial artists (63±16g). The fat percentage was (32.54%) and (29.58%) respectively. The mean cholesterol levels were found to be highest among the Wushu martial artists (191±109mg/dl) and lowest among the Kungfu martial artists (150±92mg/dl). The mean vitamin A intake was common among Karate, Taekwondo and Judo martial artists is 2±1mg. Mean beta carotene levels, calcium levels was highest among the Taekwondo martial artists

Conclusion

The poor nutritional status of athletes may predispose them to immune suppression and other chronic metabolic diseases. Hence the nutritional status of athletes is very crucial and important. The assessment has helped to define and understand the importance of nutrition for martial artists and also will give a bird's eye view of the physiological and nutritional profile of martial art exponents.

REFERENCE

Green, T.A., Svinth, J. R., (2010) *Martial Arts of the World: An Encyclopedia of History and Innovation, Volume I*, ABC-CL10,LLC, Germona Drive, Santa Barbara, California 9316-1911. | National Institute of Nutrition. *Dietary guidelines for Indians- a manual*. Hyderabad: National Institute of Nutrition, 2011 | Kim, S.H. (2000) *Ultimate Fitness through Martial Arts*, Turtle Press, 401 Silas Deane Hwy, Wethersfield | National Cholesterol Education Programme (NCEP), *ATP III Guidelines At-A-Glance Quick Desk Reference*, National Institutes of Health, (2001). | McArdle, W.D., Katch, F.I. and Katch, V.L. (2010) *Exercise Physiology: Nutrition, Energy, and Human Performance*, 7th Edition, Lippincott Williams and Wilkins, USA. | Noorul, H. R., Pieter, W., Erie, Z. Z., *Physical Fitness of Recreational Adolescent Taekwondo Athletes*, *Brazilian Journal of Biomotricity*, vol. 2, no. 4, p.230-240, 2008 | Shills M.E, Shike M, Ross A.C, Caballero B, Cousins R.J. (2006), *Modern Nutrition in Health and Diseases*. 10thEd. Lippincott Williams and Wilkins, Philadelphia | Campbell, B.I., La Bounty, P.M. and Roberts, M. (2004) *The ergogenic potentials of Arginine*, *Journal of the International Society of Sports Nutrition.*, 1(2): 35-38. | Cochran, S. (2001) *Complete Conditioning for Martial Arts*, Human Kinetics, Publishers, USA. |