



## To Measure the Efficacy of Chikoolyte in Boosting Energy Among Athletes Within the Age Group 18-35 Years

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### **Abstract:**

**Aim and Objective:** To assess the pre and post-test of the chikoolyte powder on energy level by distance coverage duration in seconds among long distance runners. **Methodology:** Quantitative approach, Quasi experimental research design was adopted to assess the efficacy of chikoolyte in boosting energy among athletes within the age group 18-35 years (35 samples) was conducted in Sports Development Authority of Tamil Nadu, Erode. Who are fulfilled the inclusion and exclusion criteria. Non randomized purposive sampling Technique was used to select the samples. Intervention tool was administered (35 grams of chikoolyte) Combination of 25g of sapota powder, 10g of coconut milk powder and 5g of jaggery powder prepared by hot cabinet dryer method. Added with 150ml of boiled milk was given during on ground practice session was assessed by using distance coverage duration in seconds with pre and post-test of the chikoolyte powder on the level of energy. **Results:** The study findings revealed that the pre-test mean differed on energy level was 4.99 and their post-test mean 4.8. The calculated paired 't' value (9.707) The mean difference was 0.19 with the significance level of  $P < 0.001$  and revealed that the performance level of athlete's post-test is enhanced with the effectiveness of chikoolyte when compared pre-test level. **Conclusion:** The results revealed that the study findings state enriched evidence that chikoolyte gives instant energy to the long-distance runners (1,500 meters) towards the concept of distance coverage duration in seconds.

**Key words:** Sports Nutrition, Athletes, Boosting energy, Chikoolyte, Energy drink, athletic performance.

### **1. INTRODUCTION :**

Sports nutrition is unique to each person and planned according to individual goals. Sports nutrition is the practical application of nutrition knowledge to a daily eating schedule with the goals of supplying energy for physical activity, facilitating the recovery and rebuilding process after strenuous exercise and optimising athletic performance in competitive events, as well as promoting overall health and wellness. The idea that sports nutrition is just for "athletes" implies that only people who are performing at their highest level are included in this field. <sup>(1)</sup>

An athlete is a term used to describe anyone who is frequently active, from fitness enthusiasts to competitive amateurs or professionals. Along with this particular spectrum of athletes, differences in precise nutrient requirements can also occur, posing the intriguing challenge of individualised sports nutrition programmes. <sup>(2)</sup>

Nutritional supplements, which can come in the form of pills, capsules, tablets, liquid, or other oral dosage forms, include one or more dietary elements (such as vitamins, minerals, amino acids, herbs, other botanicals and other substances) <sup>(3)</sup>. Athletes may use dietary supplements to help them perform better on the field. There are numerous different supplements available, including ones that improve performance (steroids, creatine), provide energy (caffeine) and speed up recuperation (protein). <sup>(4)</sup>

### **1.2 Statement of the problem**

A quasi-experimental study to measure the efficacy of chikoolyte in boosting energy among athletes within the age group 18-35 years in Erode District.



## 1.2 Objectives of the study

- To formulate the instant energy providing chikoolyte powder.
- To evaluate the macro and micro nutrient analysis of chikoolyte powder.
- To evaluate the sensory characteristics for the acceptability of chikoolyte among sensory panel members.
- To assess pre and post-test of the chikoolyte powder on energy level by distance coverage duration in seconds among athletes.
- To associate the selected demographic variables with mean differed on energy level.

## 1.3 Alternative hypotheses

**AH1** - There is a significant acceptability in the sensory characteristics of the chikoolyte powder among sensory panel members.

**AH2** - There is a significant effectiveness of the chikoolyte powder on energy level by distance coverage duration among athletes.

**AH3** - There is a significant association of selected demographic variable with mean differed distance coverage duration.

## 2. METHODOLOGY :

A quasi experimental – research design was adopted in order to assess the efficacy of chikoolyte in boosting energy among athletes within the age group 18 - 35 years. The independent variable of this study was chikoolyte. The dependent variable was immediate source of energy level. The study was conducted in Sports Development Authority of Tamil Nadu, Erode. The study samples include Athletes who are practicing long distance running (1500 meters) in the age group of 18 – 35 years. The sample size consisted of 35 samples of long-distance athletes in the age group of 18-35 years (who fulfilled the inclusion and exclusion criteria) selected by Non-Randomized Purposive sampling technique. The study included the athletes who are willing to participate in the study, Athletes who are practicing long distance running (1500 meters) in Sports Development Authority of Tamil Nadu, Erode and the study excluded those Athletes who are practicing other than long distance running (1500 meters), Athletes who are consuming other energy supplements.

The tool consisted of two parts i.e., data collection tool and intervention tool. Part A – The data collection tool included three sections. Section A consisted of demographic variables and Section B consisted of nutritional status. under Section C, the assessment of distance coverage duration.

### Section A: Assessment of Demographic Variables

The demographic variables which included locality, age, gender, type of family, size of family, dietary pattern, occupation, family income, type of diet.

### Section B: Assessment of Nutritional Status

The nutritional status of Athletes was assessed through anthropometric measurements, dietary assessment (24-hour dietary recall method) and clinical assessment with signs and symptoms with check list.

### Section C: Assessment of Distance Coverage Duration

The assessment of distance coverage duration of the long-distance runners (1500 meters) was assessed through distance coverage duration in seconds by timer with the help of sports professionals.

Part B – The intervention tool was administered included three phases with six sections. Phase:1 Product formulation, Phase: 2 Preparations of sapota fruit for drying, Phase: 3 Hot Air Cabinet Dryer and Section A: Formulation of chikoolyte, Section B: Nutritive Analysis, Section C: Microbial Analysis, Section D: Shelf-Life Analysis, Section E: Sensory Evaluation, Section F: Administration of the supplement.

#### Phase 1: Product Formulation (Procedure for preparation of sapota powder)

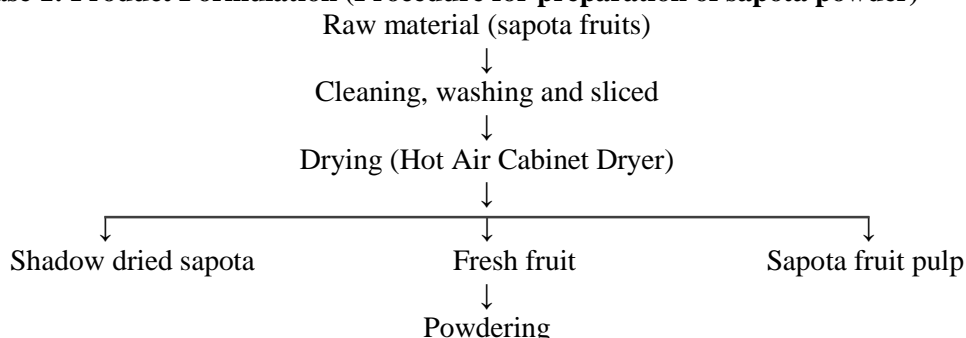


Figure 3.1 Flow chart for sapota powder preparation



## Phase: 2 Preparations of sapota fruit for drying

### Cleaning and washing

Sapota fruits were washed thoroughly under running tap water and weighed. Discoloured and infected parts were trimmed out.

### Blanching and pre-treatment

The outer skin of the ripened fruit was peeled off manually using a knife without damaging the pulp. Samples were weighed.

## Phase: 3 Preparation of the product (Hot Air Cabinet Dryer)

Chikoolyte was formulated in Fruit and Vegetable Processing Lab at SRM School of Bio- Engineering, Chennai. Hot air cabinet dryer of model CD-5, 4 kw pipe heater, blow power (KW, 50/60 HZ), temperature range 250°C with 5 trays of 50 Kg capacity. Shadow dried sapota powder, fresh sapota fruits were cut into 3mm thick slices and grinding fresh coconut milk with meat, The samples was dried using hot air cabinet drying at 80°C. The samples were dried and weight was recorded at every one hour.

## Section A:

Table 1: Formulation of chikoolyte

SL.NO	INGREDIENTS	QUANTITY
1.	Sapota powder	20gm
2.	Coconut milk powder	10gm
3.	Jaggery	5gm

## Method

Add chikoolyte powder along with 100ml of boiled milk. Blend it till it mixed properly.

## Section B: Nutritive Analysis

Nutritive analysis was done for the chikoolyte to elicit the amount of energy, protein carbohydrates, fat, calcium, iron, sodium, potassium.

## Section C: Microbial Analysis

Microbial analysis was done for the chikoolyte under Total Plate Count method.

## Section D: Shelf-Life Analysis

Shelf-life analysis was done for the chikoolyte for 2 months.

## Section E: Sensory Evaluation

The 9-point Hedonic Scale was used to analysis the product (Chikoolyte). Sensory evaluation was conducted in Sports Development Authority of Tamil Nadu, Erode. The panel members were selected on the basis of experience in the field of sports used to analysis the acceptability of the product. 35 panellists were used to tested the samples using different parameters like appearance, flavour, odour, mouthfeel, texture and overall acceptability of the product<sup>(5)</sup>.

## Section F: Administration of the supplement

Administration of the supplement (chikoolyte) was consumed by 35 long distance athletes who are in the age group of 18 - 35 years for 4 weeks in Sports Development Authority of Tamil Nadu, Erode.

After the intervention regarding chikoolyte, the investigator did the post-test assessment on distance coverage duration in seconds by timer with the help of sports professionals on the 30<sup>th</sup> day. The data collected was analysed and compared pre and post-test level to identify the efficacy of chikoolyte in boosting energy among long-distance runners (1500 meters).

The findings proved that the chikoolyte effectively provides instant energy and muscle endurance to the long-distance athletes (1500 meters runners).

## Ethical Consideration

Ethical approval was obtained from the Institutional Ethical Committee and formal approval was obtained from the Sports Development Authority of Tamil Nadu, Erode. The researcher has followed fundamental ethical principles like the right to freedom from harm and discomfort, respect to human dignity. The researcher gave full freedom to all the participants to decide voluntarily whether to participate in the study or to withdraw from the study and the right to ask questions at any time during the course of study. The investigator has maintained the study participant's privacy throughout the study. The investigator has administered the same intervention tool for all the participants.



### Statistical Analysis

Descriptive statistical was used to describe Frequency and percentage distribution was used to analyse the demographic variables, lifestyle pattern, nutritional and supplement analysis, dietary pattern, questionnaire related to energy drink, questionnaire related to formulated energy drink chikoolyte and sensory evaluation. Mean and standard deviation was used to analyse the pre-test and post-test level of efficacy of boosting energy (Instant energy). Paired ‘t’ test and p- value were used compare the pre and post-test level regarding distance coverage duration in seconds before and after consuming chikoolyte product and the association of demographic variables with mean differed distance coverage duration by the athletes.

### 3. RESULTS

**Table 2: Macro and micro nutrient analysis of chikoolyte powder**

NUTRITIONAL INFORMATION FOR 100G		
S.NO	NAME OF THE TEST	RESULT
1.	Energy (Kcal)	431 kcal
2.	Carbohydrate (g)	69.6 g
3.	Protein (g)	10.7 g
4.	Fat (g)	12.2 g
5.	Calcium (mg)	80 mg
6.	Iron (mg)	8.5 mg
7.	Sodium (mg)	27 mg
8.	Potassium (mg)	15 mg
9.	Magnesium (mg)	12 mg

The Majority of the athletes 20 (57.1%) was in the age group of 18 - 23 years, 21 (60.0%) of them are male participants, 27 (77.1%) was in the rural area, 18 (51.4%) were graduates, 24 (68.6 %) athletes were moderate workers, 14 (40.0%) had family income of rupees 6,175-18,496, 29 (82.9 %) were from nuclear family, 29 (82.9%) has 2 – 4 members in the family, 35 (100%) were participating 1500 meters long distance running.

The majority of the athletes 35(100%) had no recent weight changes and they are all satisfied with their current weight, 35(100%) athletes never tried to control their body weight with fasting, vomiting, laxatives, diuretics and diet pills and they are doesn’t lose weight regularly to meet the requirements of sport, 33(94.3%) athletes that they would not avoid certain foods.

The majority of the athletes 29(82.9%) have not follow any diet restriction, 35(100.0%) have a good appetite, 33(94.3%) do not skip meals, 29(82.9%) have the habit of eating snacks, 25(71.4%) consume more than 3 meals per day, 21(60.0%) consume the kind of dry fruits and nuts, sprouts, sundals snacks, 33(94.3%) consume fruit juices and water in between the meals, 22(62.9%) of them consume more than 3 litres per day, 29(82.9%) of the participants are non – vegetarians.

**Table 2: Assessment of 24 Hours Dietary Recall**

S.NO	24 HOURS DIETARY RECALL	SCORE
a)	Energy (Kcal)	2380.29 kcal
b)	Carbohydrate (g)	310 g
c)	Protein (g)	50 g
d)	Fat (g)	70 g
e)	Iron (mg)	12.22 mg
f)	Vitamin c (mg)	29.77 mg
g)	Sodium (mg)	2.3 mg

The majority of the athletes 33(94.3%) does not have a sign of thin/depigmented hair, 31(88.6%) athletes does not had a sign of easily plucked hair, none of them have a sign of night blindness, 33(94.3%) athletes does not have a sign of spoon shaped nails, 22(82.9%) athletes does not have a sign of transverse lines, 33(94.3%) athletes does not have a sign of hyperpigmentation, 27(77.1%) athletes does not have a sign of dry skin, 35(100%) athletes does not have a symptom of bleeding gums, 33(94.3%) athletes does not have a sign of loss of tooth enamel, 35(100%) athletes does not have a sign of sore mouth and tongue.



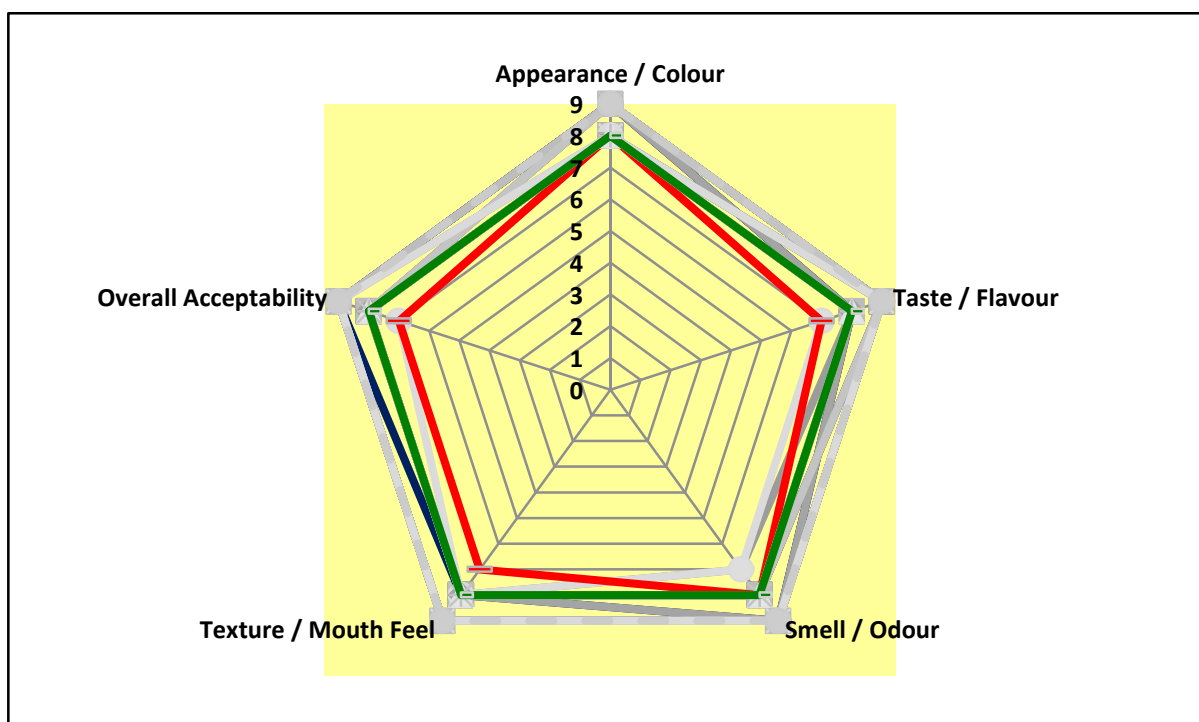
**Table 3: Assessment of anthropometric assessment to the athletes**

**N=35**

S. No	Anthropometric Assessment	Minimum	Maximum	Median	Mean	S. D
a)	Height in (m) <sup>2</sup>	156.0	177.80	168.70	169.84	6.57
b)	Weight in kg	50.0	79.70	62.70	67.71	9.13
c)	BMI	20.30	25.76	23.50	23.42	1.53
d)	WHR	0.75	0.99	0.82	0.82	0.06

The majority of the athletes 31(88.6%) have knowledge about energy drink, 31(88.6%) of them doesn't have the knowledge that sapota powder gives instant energy; 19(54.3%) of them prefer energy drink in the volume of 100 – 150ml, 35(100.0%) all of the participants rate the energy drinks are effective for athletes; 16(45.7%) of the long-distance athletes have been crossed in the duration of 4.6 – 5.0 mins and 16(45.7%) of the long-distance athletes have been crossed in the duration of >5.0 mins.

All the participant 35(100.0%) like the chikoolyte product; 35(100.0%) all the participants have not any discomfort or stiffness occurs after drinking chikoolyte product; 35(100.0%) all the participants have felt normal stamina is increased after drinking chikoolyte product; while considering the running hours after the consumption of the chikoolyte product 25(71.4%) are able to run 1 hour – 2 hours; 35(100.0%) all the participants have preferred chikoolyte to others athletes; while considering 18(51.4%) of them like very much and they would be to recommend other athletes to start consuming chikoolyte; 20(57.1%) of the long-distance athletes have been crossed in the duration of 4.6 – 5.0 mins.



**Figure 1: Radar graph for Sensory Evaluation**

The above figure:1 shows that in sensory evaluation while considering colour 21(60.0%) of them like extremely, regarding taste 21(60.0%) of them like extremely, while considering odour 20(57.1%) of them like extremely, regarding mouth feel 18(51.4%) of them like extremely and the overall acceptability of the product was liked extremely by 19(54.3%).

**Figure: 2 Boxplot showing the comparison of distance coverage duration in seconds by the athletes before and after the administration of chikoolyte (Median: Before – 4.99, After – 4.8)**



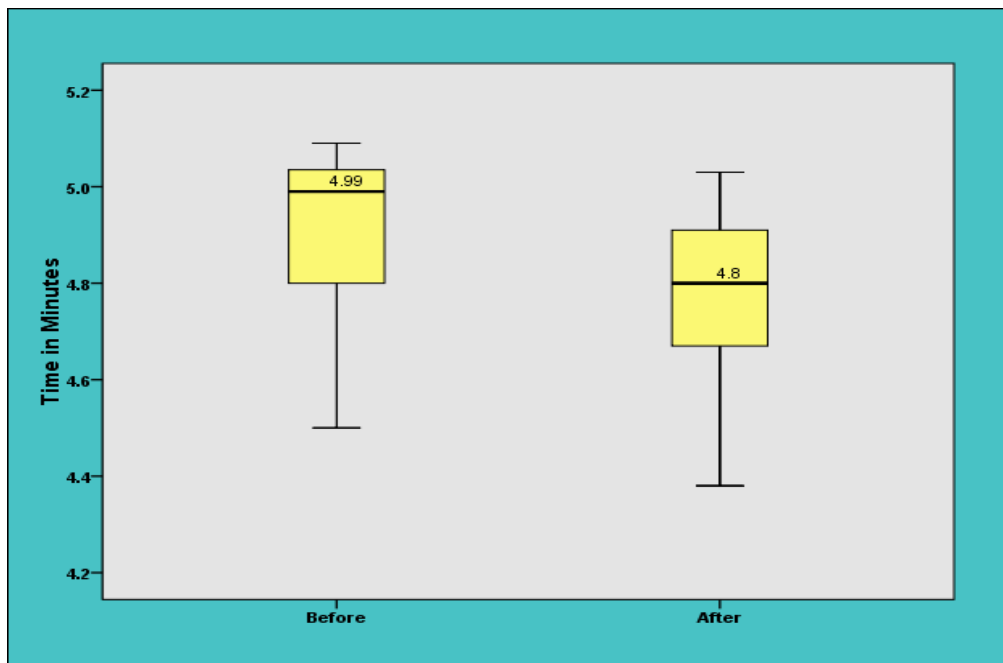
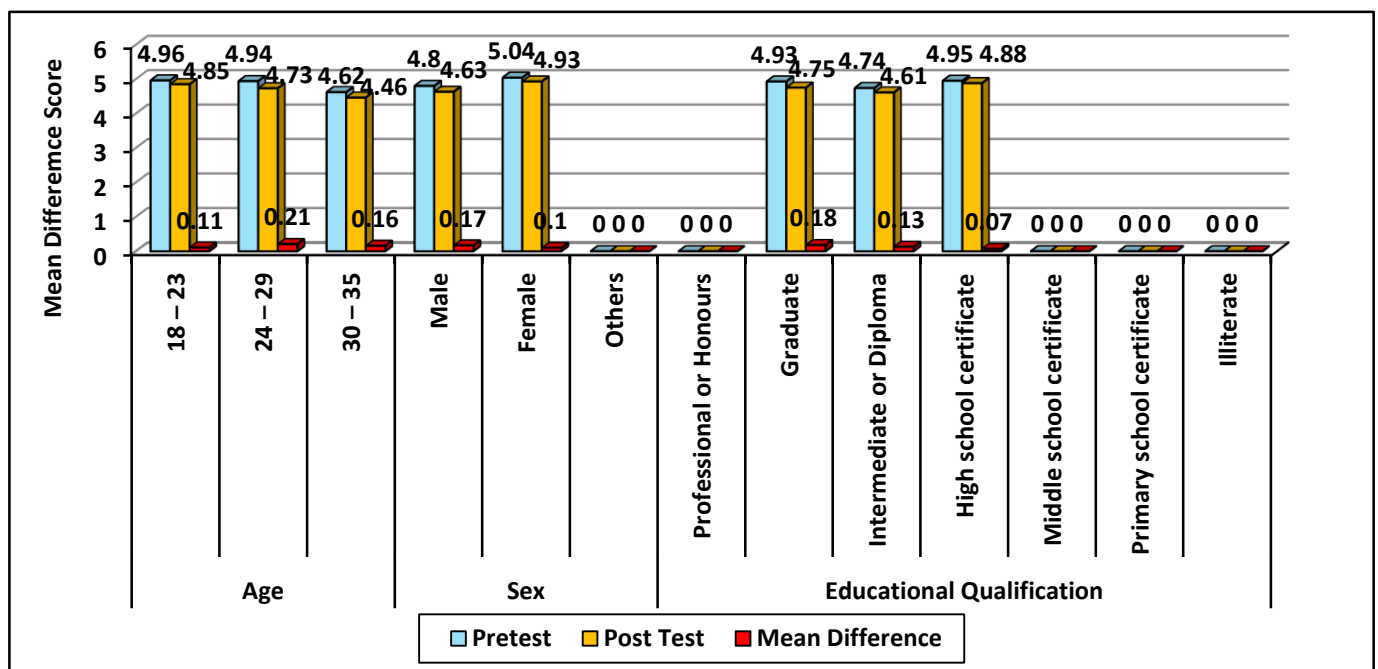


Figure 3: Association of demographic variables with mean differed distance coverage duration by the athletes.

The above figure: 3 depicts the association of selected demographic variables with mean differed distance coverage duration by the athletes and it illustrate there is significant association between age, sex and educational qualification and mean differed distance coverage duration by the athletes.

#### 4. DISCUSSION

This clearly indicates that long distance athletes who are consuming chikoolyte were get instant energy.



Chikoolyte contains natural, digestible sugars like fructose and sucrose, which provide instant energy to the athletes (long distance runners 1500 meters).



The study's findings revealed that chikoolyte is effective at increasing energy levels. Evidently, chikoolyte is used to provide instant energy to athletes by measuring the distance covered duration in seconds to determine the effectiveness of chikoolyte.

The pre-test score was 4.99, while the post-test score was 4.8. The mean difference was 0.19 with a significance level of  $P < 0.001$ , and it revealed that the performance level of the athlete's post-test is improved with the effectiveness of chikoolyte when compared to the pre-test level.

### **Limitation**

The researcher had difficulty to collecting studies related to chikoolyte providing instant energy to the athletes. The researcher also had difficulty in obtaining setting permission from the Sports Development Authority of Tamil Nadu.

### **5. CONCLUSION :**

The study aimed to formulate natural energy drink chikoolyte for the substitute of various sports drinks with dense of nutritive value. The efficacy of chikoolyte were assessed towards the concept of boosting energy (instant energy) to the long-distance athletes.

Thus, the study findings state enriched evidence that chikoolyte provide instant energy to the long-distance athletes (1,500 meters) towards the concept of assessing pre and post-test level of the chikoolyte powder on energy level the distance coverage duration in seconds.

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### **ABBREVIATIONS**

- 1) **WHR** - Waist-Hip Ratio
- 2) **BMI** - Body Mass Index

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