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NUTRITION VIEWS AND TRAINING PRACTICES OF RECREATIONAL RUNNERS

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ABSTRACT

Background: Running is in vogue and participation in running events among Indians has increased remarkably. Nutrition is an important aspect of running, medical assessment and correct training is essential for performance and safety.

Objective: The present study was undertaken to assess and evaluate the nutritional knowledge, attitudes, and training practices of Indian recreational runners.

Methodology: The study was conducted in two regions- Western and Southern India. Semi-structured questionnaire included participant characteristics, training, nutritional practices during training and competition, supplement intake, medical and fitness assessment. Web-based survey questionnaire was circulated among recreational running groups in Chennai, Mumbai and Pune. Informed consent was obtained from the participants. The cohort 296 recreational runners, both men (n=197) and women (n=99) aged 25 to 70 years participated in the study. The data was analyzed using Chi square test in SPSS 20.

Results: The study participants were well educated and 82.4% were working professionals. 41.6% of the runners had done medical and fitness assessment before training. About 38.2% were novice runners and 61.9% had participated in ≥2 running events. The participants trained for 3 to 5 days in a week with 79.1% training in a group, 26.4% with a coach, 9.1% used a mobile app, and 57.1% used a fitness tracker (Garmin-24.3%; Fitbit-14.9%), running websites (58.4%). Running helped to improve endurance(71.6%), strength(53.7%), stamina(58.4%), good sleep(46.3%), reduced stress(48.2%), reduced illness(51.7%). Only 10% of the runners consulted a nutritionist, while most runners got nutrition information from coach (28.4%), peers (56.2%), and websites (43.2%). Runners had varied pre-training food choices; only 18% consumed a sports/electrolyte drink. During training runners consumed water (43%), sports drink (15.1%), sports gel (6.1%), fruits (12.8%) and chocolates (11.8%). Only 22.1% of runners used nutritional supplements- proteins and sports drinks, to enhance performance. The present study showed a significant difference ($p<0.0001$) in training practices, dietary strategies across gender, age, and regions (Western/Southern India) and most importantly novice and trained runners.

Conclusion: The study depicted paucity of nutrition knowledge among recreational runners. There is an urgent need to educate coaches and athletes to help them achieve their health and fitness goals.

INTRODUCTION

Marathon races are in vogue and participation in running events among Indians has increased remarkably. Good training, nutrition, hydration are the most important aspects of marathon running for performance as well as safety. Nutrition plan is based on the training hours, what is right to eat before, during and after should be known to runners to optimize performance. The timing of food and fluid intake, choice of foods, carbohydrate loading, supplement intake that can boost performance must be known to the enthusiastic recreational runner.

Inadequate knowledge and inappropriate dietary practices can not only impact performance, but also can affect health and safety. Low sodium levels can cause hyponatremia, and it usually occurs in novice runners. Dehydration and electrolyte imbalance can result in heat illness and heat exhaustion in some athletes[1,2,3]

Although running is becoming popular in India, the knowledge about appropriate nutrition strategies, training protocols, followed by recreational runners has not been ascertained. Nutrition can help with the safety of marathon running by helping avoid preventable injuries and illness related to inadequate intake, such as dehydration, or excessive intake, such as hyponatremia[4,5,6]. Nutrition is an extremely important aspect of endurance events such as the marathon.

However, research on the training, dietary and hydration practices on Indian marathoners is scarce and little is known about their views on the credibility of various sources of nutrition information.

NEED FOR THE STUDY

Recreational running is quite new to India but it is becoming increasingly popular. In addition to the number of participants also the number of events is growing rapidly. Every major city has a full marathon or at least a few half marathons.

In 2016 over 700 running events were organised nation-wide, which is 81% more than 2015 events. Shorter distances such as 5 or 10 kilometres used to be most popular for events, but since recently Indian runners are graduating to more serious challenges such as marathons or - really putting their endurance to the test – ultra runs. Indian runners also embark on foreign adventures; 257 of the 50,000 finishes who pounded the pavement of the New York marathon were from India.The cosmopolitan cities like Mumbai, New Delhi and Bangalore top in marathon participation[6].

Since nutrition is such a crucial part of marathon running, it is important for these athletes to be aware of and understand the nutrition guidelines. Knowing where the information is coming from and how to implement these guidelines is also important for both safety and performance during marathons.

The purpose of this study was to investigate the nutritional knowledge, attitudes, and training practices of Indian recreational runners. This study also looked at training method, nutrition practices during training and previous races. In addition, relationships between gender, age, marathon experience, type of training and source of nutrition information were explored.

METHODOLOGY

Semi-structured questionnaire was designed and pre-tested for its accuracy and validity. The questionnaire included socio demographic information, training, nutrition knowledge, attitudes, practices, nutritional supplement intake and awareness on medical and fitness assessment. The web-based questionnaire (google forms) was circulated among marathon running groups from Chennai, Mumbai and

Pune. Informed consent was obtained from the participants. The study participants were then mailed nutrition tips to create awareness, complementary to their participation in the survey. The data obtained was analysed using Chi square test in SPSS 20.

RESULTS AND DISCUSSION

The web-based survey got a very good response across the three cities of Chennai, Mumbai and Pune. The participants were 296 recreational runners- males(n=197) and females(n=99) aged 25 to 70 years. The data obtained was classified as Southern India and Western India since few of the participants belonged to other cities in these two regions of India.

PARTICIPANT CHARACTERISTICS

Table 1 depicts the characteristics of participants. The data expressed in mean +/– standard deviation mean age of participants was 40years across both the regions. This is an indicator that Indians take up marathon running above the age of 35years to attain health and fitness. The BMI of the participants was in the normal range. The study participants were well educated and 82.4% were working professionals and very few were students or retired. The choice of diet was similar in both the regions-vegetarians, non-vegetarians, and only 5% followed vegan, keto, paleo or other diets.

Table 1: Characteristics of study participants:

Characteristics	Southern India	Western India	Total
Gender- Female(n)	46	53	99
Male(n)	118	79	197
Age(years)*	39.2±9.32	41.6±7.95	40.3±8.81
BMI(Body Mass Index)*	24.2±3.05	24.9±2.81	24.5±2.96
Education(%)			
Matriculation	1.8	4.5	3.0
Graduation	46.3	48.5	47.3
Post-graduation	51.8	47.0	49.7
Occupation (%)			
Homemaker	10.4	15.2	12.5
Service	62.2	56.1	59.5
Business	20.7	21.2	20.9
Professionals-CA	2.4	1.5	2.0
Student/Retired	4.3	6.1	5.1
Type of diet (%)			
Lacto-ovo-vegetarian	12.8	15.9	14.2
Vegetarian	29.9	32.6	31.1
Non-vegetarian	49.4	49.2	49.3
Other	7.9	2.3	5.1

Values expressed as Mean +/– SD

Training strategies of participants:

The participants had taken up running to attain health and benefits. The benefits of running cited were improved endurance(22%), improved strength(16%), improved stamina(18%), better sleep quality(14%) and reduced stress(16%) for better health. **Table 2** elaborates the different running strategies used by the participants.

The training strategies- duration of training, training methods, and intensity of training varied greatly among the participants. Novice runners were about 38.2% and were preparing to participate in an upcoming marathon while those who were training more than 5years was relatively less-16.6%. Training ranged from 3 to 5days in a week, about 76-79% trained with a partner or in a group while only 20-23% trained alone. Only 26.4% of the runners trained with a coach. Although, various mobile apps are available to monitor training only 9.1% of the runners used it to track their training(Table 2).

Fitness trackers like fitbit, tom tomspart, polar, garmin are popular. However, 42% did not use any fitness tracker and could be ascribed to the fact the around 38.2% were novice runners. The others used trackers like Fitbit/Samsung/Tom tom spark/polar-14.9%, while Garmin was a popular choice and 24.3% regular runners used it.

The runners were also engaged in other sport activities. Cross-fit, resistance training - an important training regime each runner should undergo to strengthen muscles and improve flexibility. But only 39% of the participants were into the practice of cross fit training. Other

Table 2: Training characteristics of study participants

Characteristics	Southern India	Western India	Total
Number of races participated (%)			
None participating first time	32.9	44.7	38.2
1-4	15.2	18.2	16.6
>=5	51.8	37.1	45.3
Training duration in year (%)			
Less than a year	7.9	20.5	13.5
1-2 years	45.7	57.6	51.0
3-4 years	26.8	9.1	18.9
5 and more years	19.5	12.9	16.6
Number of days trained in the week			
<=3 days	36.6	35.6	36.1
4 days	26.2	52.3	37.8
>=5 days	37.2	12.1	26.0
Train for upcoming race (%)			
Alone			
No	71.3	82.6	76.4
Yes	28.7	17.4	23.6
With group/ club			
No	21.3	19.7	20.6
Yes	78.7	80.3	79.4
With partner			
No	89.6	97.0	92.9
Yes	10.4	3.0	7.1
With coach			
No	80.5	65.2	73.6
Yes	19.5	34.8	26.4
Using mobile app			
No	89.6	92.4	90.9
Yes	10.4	7.6	9.1
Use fitness tracker (%)			
No	40.2	46.2	42.9
Fit bit/ Samsung/Tom Tom Spark/ Polar	11.6	18.9	14.9
Garmin	30.5	16.7	24.3
Other	17.7	18.2	17.9
Other exercises (%)			
Cycling			
No	63.4	88.6	74.7
Yes	36.6	11.4	25.3
Swimming			
No	81.1	89.4	84.8
Yes	18.9	10.6	15.2
Resistance training/Cross fit			
No	53.0	69.7	60.5
Yes	47.0	30.3	39.5
Yoga/Pilates			
No	78.7	65.2	72.6
Yes	21.3	34.8	27.4

participants were involved in cycling (25%), swimming (15%), yoga (27%). In addition, about 43 % of the participants did not use any tools to access their intensity.

Figure 1 depicts the choice of websites that the runners used regularly to gain information on running. The use of websites was more in Southern India compared to Western India. The most popular was runners world, followed by 'runners for life' the website of a running group based in Bangalore.

Nutrition knowledge, attitudes and practices of runners

Nutrition is of utmost important to train and compete in marathons. Nutrition can help in improving the performance of marathon runners and can help in prevention of injuries, illness due to dehydration, hyponatremia [3] To enhance performance its is necessary to obtain correct nutrition information or knowledge. **Figure 2** illustrates the source of nutrition information.

It was observed that nutrition information was primarily obtained from fellow runners/ groups. Websites, magazines, coaches are common sources of information however, they may not always provide credible or scientific information. Consultation with a 'sports nutritionist' was minimal in comparison to other sources of nutrition information. There is a need to create awareness among runners the importance of credible nutrition resource to train and perform better.

Dietary practices of runners during training Before Run/Race

The dietary practices of runners before, during and after running were obtained. The usual nutrition strategies are intake of high carbohydrate foods, hydration well in advance before the training/race[4]. In the present study, about 26% of the participants reported intake of cereal grains, 14.5% consume dairy products, 13.9% consume starchy vegetables, 11.8% consume plant proteins like dal, beans, chana, 4.4% consume animal foods prior to training. Most of the people (81.4%) drink water before a training run. A little more than a quarter of participants also drink some type of electrolyte drink before a training run.Other drinks that runners consumed before a training run

Fig 1: Choice of Websites to support training

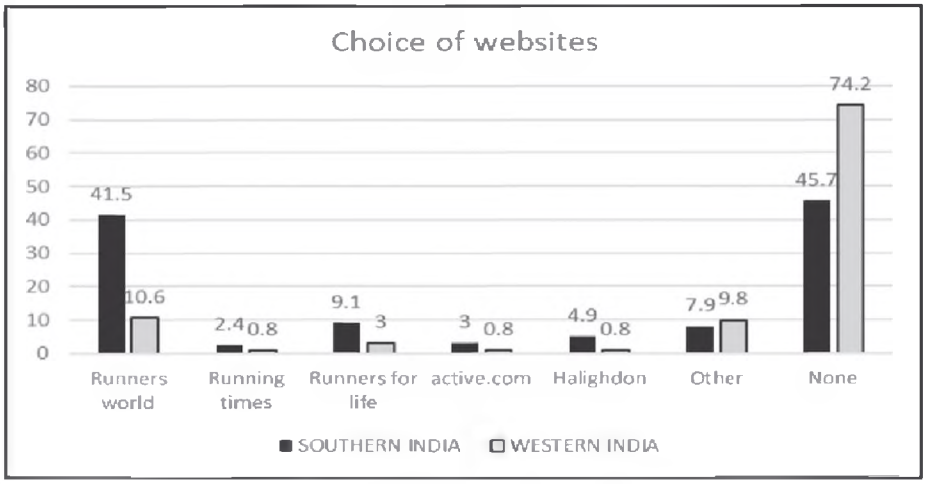
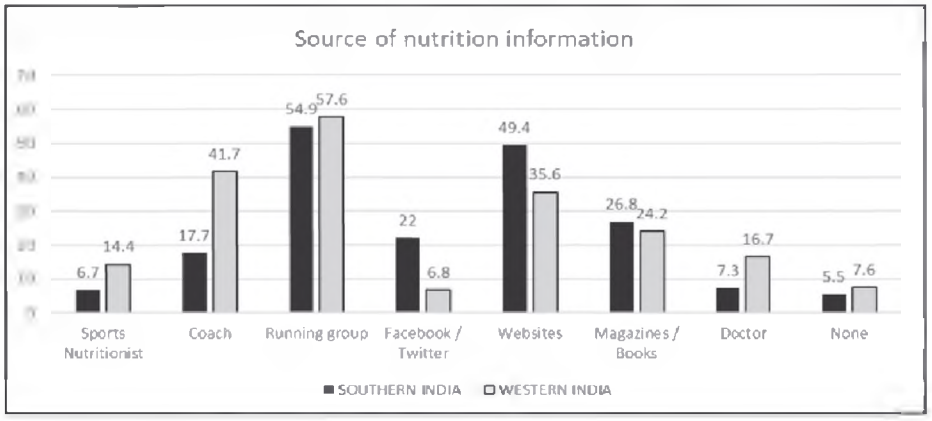


Fig 2: Source of Nutrition & Information



included protein drinks, milk and fruit juice.

Carbohydrate loading is a commonly used method to maximize glycogen stores before participating in an event that will deplete the stores. Maximizing glycogen stores can delay fatigue and allow runners to maintain their pace for a longer time.Carbohydrate loading has been a common practice since the 1960s [9,10]. But in the present study only 40% participants took a high carbohydrate intake the previous night before the race.

During run/race

Nutrition during runs depends on the duration of the run. For events lasting 2.5 to 3 hours, up to 80-90 grams of carbohydrate per hour should be consumed, consisting of multipletransporter carbohydrates to maximize absorption [9,11]. However, this needs to be assessed on anindividual basis because individuals may have different responses to consuming this amount of carbohydrate[11]The present study showed that most of the runners consumed water (43.6%)

Table 3: Food choices of participants during training

Food choice	Southern India(%)	Western India(%)	Total(%)
Water	41.5	46.2	43.6
Sports drink	15.2	16.7	15.9
Sports gel	6.7	5.3	6.1
Fruits	13.4	12.1	12.8
Granola Bar	2.4	3.0	2.7
Biscuits	4.9	3.8	4.4
Chocolates	13.4	9.8	11.8
None	54.3	46.2	50.7

**Values expressed as percentages*

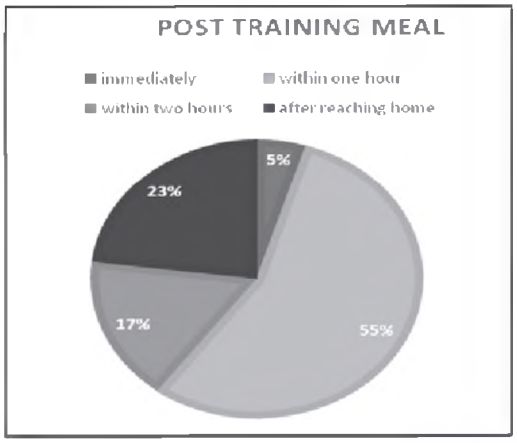
during the run and a very small percentage consumed sports drink, sports gel or energy bars. **Table 3**shows the food choices of runners during training.

Post training/race intake

Nutrition in the period of time following training or competition is extremely important. A variety of nutrients are needed during this time, including carbohydrate, protein, fluid, and electrolytes. Directly following exercise, the muscles are able to take up more glucose and store it as glycogen compared with other times due to the increased GLUT 4 receptors on the surface of muscle cells[13,14]. In the present study 55% of the participants consumed food within one hour of the training session.

Figure 3 portrays the habit of the participants who consumed post training meal at different timings.

Figure-3 Post training meal of the participants



Nutritional supplement use participants

Nutritional supplements are extremely popular. India is the fasted growing market for supplements and fitness enthusiasts are considered to consume supplements to support or enhance training. Protein supplements, sports drinks and gels, energy bars are commonly used by runners.Around 77.7% of runners did not consume any supplements. Supplements were mainly consumed by runners who were training for more than 3 to 5years. There was not much difference in supplement intake region or gender wise. Protein supplement intake was maximum(15.5%), followed by sports drinks(6.8%) and energy bars(5.4%). The intake of ayurvedic and pre-workout supplements was minimal(Table 4).

Awareness on medical and fitness assessments:

Running has several health benefits, however running could also increase some health risks and injuries. Hyponatremia, dehydration, heat stroke, myocardial infarction, coronary atherosclerosis, and sudden cardiac arrests and deaths are observed. The number of novice runners is increasing and the risk of death and other health issues may increase. Many are not aware of the causes and contributors that increase incidence of death and may be prevented by proper screening before training for marathons. In the present study, we observed that majority of the runners did not undergo any type of medical and fitness test before training for marathon.

Nutrition education:

Considering the need of the recreational runners, a document / file containing pre training meal options, during training options, post training meal options, avoid list, general

Table 4: Supplement usage by participants

Supplement	Southern India(%)	Western India(%)	Total(%)
Protein based drinks	12.2	19.6	15.5
Sports drinks	6.7	6.8	6.8
Carbohydrate gels	1.2	0.0	0.7
Energy bars	4.9	6.1	5.4
Ayurvedic-herbal/supplements	1.2	0.8	1.8
B-Alanine	0.0	0.8	0.3
Pre-workout	0.6	2.3	1.4
None	81.1	73.1	77.7

*Values expressed as percentage.

guidelines regarding the meal timing, fluid guidelines were sent to all the participants involved in the study.

Summary and conclusion:

The present study showed a significant difference ($p<0.0001$) in training practices, dietary strategies across gender, age, and regions (Western/Southern India) and most importantly novice and trained runners. The increasing popularity of marathons is a welcome sign among Indians who are prone to non-communicable diseases. Appropriate nutrition education at different stages of training will help runners customise their nutrition demands. Adequate sport nutrition principles will help maximise the potential of a runner and enhance his performance. This is one of the first study that reviewed the Nutrition views of Indian recreational runners, training strategies, dietary practices, and awareness on medical assessments. The study can be further conducted on other recreational runners to educate them on nutrition, training needs of recreational running.

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