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DIETARY ASSESSMENT OF OMEGA-3 STATUS AND OMEGA-3 SUPPLEMENTATION AMONG ATHLETES: A SURVEY STUDY

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Abstract

The study focused on the dietary assessment of omega-3 status and omega-3 supplementation in athletes. The survey on the assessment of omega-3 was carried out on one hundred and fifty (N=150) athletes from Kerala. Well-structured questionnaires were used to gather the data. The study was analyzed statistically by descriptive statistics. The result found that the athletes do not have a thorough knowledge of the omega-3 and not taking an adequate amount of omega-3 fatty acids through their diet

Introduction

Sports nutrition plays a pivotal role in addressing athletes' excessive energy requirements, reducing the risk of injury, and hastening recovery. This makes it a topic of considerable interest and study. Researchers in sports nutrition have recently focused on omega-3 fatty acid supplementation. Despite the paucity of studies in this area, all studies that have been conducted found that O3 FA supplementation leads to significant changes in athletic performance. A recent systematic review identified 32 studies related to O3FA supplementation and various markers of physiology and performance in athletes. And overall, a positive association between O3FA supplementation and reaction time, skeletal muscle recovery, inflammatory markers and cardiovascular dynamics was reported (Lewis et al., 2020). This underlines the requirement for greater in-depth research. In this regard, this study attempted to comprehend how and to what extent O3 FA is impacted in the sports diet, and to evaluate the level of the athlete's awareness about this by examining the athlete's dietary habits, O3 FA supplementation, injury, and recovery rate. The human body is capable of making most of the types of fats it needs from other fats or raw materials. That isn't the case for omega-3 essential fats and which makes them incredibly important. O3FA is one of the essential polyunsaturated fatty acids. And more specifically the long-chain fatty acids- eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are termed O3FA. The predominant dietary source of O3 FAs is seafood, especially fatty fish. This EPA and DHA function as structural elements inside phospholipid cell membranes. And has also been shown to play

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significant physiological roles among the cardiovascular, nervous, and skeletal muscle systems, and in the body's inflammatory response. In athletes, omega-3 fatty acids have been associated with the management of exercise-induced oxidative stress, delayed onset of muscle soreness, aerobic and anaerobic endurance capacity, and skeletal muscle health. As the dietary recommendations for O3FA are highly variable, it adds a challenge to the identification of athlete-specific needs and makes it difficult in establishing athlete-specific guidelines for O3FA supplementation. A few researchers recommended an intake of 1-3 g of EPA + DHA daily, including both dietary sources and supplements that could provide benefits to athletes with a low risk of undesirable side effects. Athletes' diets have been shown to contain sub–optimal levels of O3FA. Based on a dietary assessment (targeted food frequency questionnaire) of more than 1,500 athletes from nine NCAA Division I athletic programs, Ritz et al., (2020) observed that less than 40 % of athletes met recommendations to consume fish or seafood at least twice weekly and less than 10 % of athletes met the Academy of Nutrition and Dietetics 'recommendation to consume > 0.5 g EPA + DHA daily. Wilson and Madrigal (2016) reported similar findings in collegiate athletes too. Even though there is only little information about athletes' O3 FA status is available, similar studies conducted earlier prove the low supplementation and dietary status of omega-3 FAs. The purpose of the study was therefore to examine the dietary assessment of omega-3 fatty acids among athletes in Kerala.

Materials and Methods

The study was undertaken in a survey method, where the questionnaire was constructed under the supervision of experts and a guide. A total of 150 athletes from Kerala took part in the study voluntarily. The questionnaire was designed in a manner for the dietary assessment of Omega-3 status and Omega-3 supplements. The results were analyzed in frequencies and percentage format.

Findings

The demographic characteristics cross-section of the participants who volunteered in the survey is shown in Table 1.

Table 1

Demographic characteristics and cross-section of participants.

		Freq.	*Percent*
Gender	Male	79	52.7
	Female	71	47.3
Training Centre	SAI	4	2.7
	Sports Council	15	10.0
	Sports Academy	8	5.3
	Sports Club	9	6.0
	Professional Training Centre	7	4.7
	Physical Education	107	71.3
Level of participation	District	20	13.3
	State	52	34.7
	National & above	78	52.0

Table 2

Frequency and percentage table of participants with respect to training and medical history

	Freq.	*Percent*	
Number of years into formal training	Less than 2 years	19	12.7
	3 years	14	9.3
	3-5 years	31	20.7
	More than 5 years	86	57.3
Training days per week	1-3 days	22	14.7
	3-5 days	65	43.3
	More than 5 days	63	42.0
Lower body injury	Yes	109	72.7
	No	41	27.3
Injury caused while training	Yes	104	69.3
	No	5	3.3
Description of injury	Acute	73	48.7
	Chronic	34	22.7
	NA	2	1.3

Table 1 explains the demographic variables and cross-section of the study. In this study 52.7% of the participants are male and 47.3% are female. In the case of the training center, 71.3% of the participants are doing Physical education, 10% of the participants are from the sports council and 6% are from sports clubs. With respect to the level of participation, 52% were from the national and above level, and 34.7% represented state-level tournaments.

Table 2 represents the frequency and percentage of participants with respect to training injury and medical history. More than half of the participants are training for more than 5 years, and 20.7% of the participants trained for 3-5 years. With respect to training days in a week, 43.3% are training for 3-5 days in a week, and 42% are training for more than 5 days. In the case of medical history majority of the participants have suffered an injury, out of which 69.3% of the injuries were caused during the training period. Of the participants who were injured during the training period, they suffered acute injuries, and 22.7% of the participants suffered chronic injuries.

Table 3

Frequency and Percentage Analysis of Participants with respect to daily wellness.

		Freq.	*Percent*
Sleep Quality	Poor (1-5)	18	12.1
	Optimal (6-10)	132	88
Fatigue	Poor (1-5)	64	42.6
	Optimal (6-10)	86	57.3
Stress	Poor (1-5)	73	48.6
	Optimal (6-10)	77	51.4
Muscle soreness	Poor (1-5)	74	49.4
	Optimal (6-10)	76	50.6

Table 4

Frequency and percentage analysis of participants with respect to the information on intake of supplements

		Frequency	*Percent*
Intake of supplements	Yes	16	10.7
	No	134	89.3
Reason for using dietary supplements	Deficiency	1	6.25
	Maintenance	11	68.75
	Recovery	9	56.25
	Others	2	12.5
Type of dietary supplement	Creatine	3	18.75
	Protein	8	50

	Omega 3	4	2.5
	BCAA	3	18.75
	Multivitamin	5	31.25
	Caffeine	1	6.25
	Glutamine	1	6.25
	Others	4	25
Recommendation of supplements	Sports nutritionist	5	31.25
	Coach	8	50
	Other	3	18.75

Table 3 represents participants' frequency and percentage analysis with respect to daily wellness. Of the sleep quality, 88% of participants are having optimal sleep in their daily routine, and only 12.1% of the participants were having poor sleep quality. In fatigue, half the percentage of participants are not fatigued in their daily wellness, were as 42.6% of participants are getting fatigued in their daily wellness. Same as the stress 51.4% of participants are not getting stressed in their daily wellness and nearly half of the participants are getting stressed in their daily wellness. The same results have been shown in muscle soreness also.

Table 4 represents participants' frequency and percentage analysis with respect to the information on the intake of supplements. The results show that 89.3% of participants didn't take any dietary supplements and only 10.7% of participants take dietary supplements. The reason for using dietary supplements out of the 10.7% of participants who take supplements, 68.75% of participants are taking supplements for maintenance, 56.25% take dietary supplements for recovery, and only 6.25% take them to balance the deficiency. The researcher also asked which type of supplements the participants were using, 50% of them are taking protein supplements, 31.25% take multivitamins, 25% takes other supplements, and 18.75% take BCAA supplements. The last question was asked about where the supplements were recommended to the participants. 50% of the supplements were recommended by coaches, 31.25% of the supplements were recommended by sports nutritionists, and 18.75% of the other recommendations.

Table 5 represents the frequency and percentage of participants with respect to respect to omega-3 food frequency list. The results have shown that 30% of the participants have 1-3 mackerel per month, majority of the participants are taking sardine once a month or not at all, same results with higher percentages have been shown for tuna, salmon,shrimp, oysters, spinach, cauliflower, broccoli, walnuts, soybeans, flaxseeds, mustard, flaxseed oil, and soyabean oil. But in the case of eggs, 32% take 3-4 eggs in a week. 31.3% of the participants are taking 1-3 times of red meat and yogurt in a month.

Table 5

Frequency and percentage of participants with respect to Omega-3 food frequency list.

Omega-3 Food		*Freq*	*Percent*
Mackerel	1-3per month	45	30.0
Sardine	Never/once a month	53	35.3
Tuna	Never/once a month	85	56.7
Salmon	Never/once a month	115	76.7
Shrimp	Never/once a month	88	58.7
Oyster	Never/once a month	123	82.0
Red meat	1-3 per month	47	31.3
Egg	2-4 per week	48	32.0
Spinach	Never/once a month	55	36.7
Cauliflower	Never/once a month	77	51.3
Broccoli	Never/once a month	105	70.0
Walnuts	Never/once a month	90	60.0
Soybeans	Never/once a month	59	39.3
Flaxseeds	Never/once a month	111	74.0
Mustard	Never/once a month	53	35.3
Yogurt	1-3per month	43	28.7
Flaxseed oil	Never/once a month	104	69.3
Soyabean oil	Never/once a month	112	74.7

Table 6

Frequency and percentage analysis of participants with respect to Omega-3 supplements

		Freq	*Percent*
Intake of omega-3 supplement	Yes	14	9.3
	No	136	90.7
Type of Omega-3 supplement	Fish oil	8	57.1
	Cod liver oil	2	14.3
	Others	4	28.6
Number of times serving Omega-3	1-2 times	8	57.1
	3-4 times	2	14.3
	5-7 times	4	28.6

Table 6 represents the response of participants with respect to Omega-3 supplements. The results show that 90.7% of the participants are not taking any omega-3 supplements. 57.1% of the participants are taking fish oil as an omega-3 supplement, 14.3% are taking cod liver oil as an omega-3 supplement and 28.6% of the participants are using other methods as their omega-3 supplements. 57.1% of the participants are taking 1-2 times per week of omega-3 supplements, 14.3% are taking 3-4 times per week of omega-3 supplements and 28.6% are having 5-7 times a week of omega-3 supplements.

Discussion of findings

The study aimed to assess the dietary assessment of omega-3 and omega-3 supplements. 150 participants in Kerala from various games and sports took part voluntarily, of which 52.7% of the participants are male and 47.3% are female. In this study, more than 70% of the participants are from physical education where they have participated in national and state-level competitions in their respective games and sports. 50.7% of participants have undergone more than 5 years of formal training where they have been training for 3-5 days or more than 5 days in a week. The study also resulted that 72.7% of the participants have lower body injuries that the injuries which were caused during training sessions. The majority description of the injury was acute injuries, but also 22.7% of the participants are having chronic injuries. Sleep quality, fatigue, stress, and muscle soreness were also assessed. In which majority of the participants, their sleep quality was in the optimal score, only 12.1% of the participants were having poor quality of sleep. In the results of fatigue, 57.3% of the participants were in the optimal score and 48.6% were in a poor score. In stress, 48.6% were not stressed also more than 50% of participants were stressed. Almost the same results were found in muscle soreness, 50.6% of participants were having muscle soreness, and 49.4% were not having muscle soreness, as shown in the demographic variables, the participants who took part in the study are sportspersons who are currently taking part in national level and state level competitions, also they are having a minimum of 3-5 days session in a week, where the majority of the participants were into formal training for a period of more than 5 years, these training schedules may have a chance, where the participants can get fatigued, have sore muscles and also stressed while participating professionally.

About the question on supplement intake, only 10.7% responded that they are using supplements. Most of the participants use only one type of supplement. Out of the participants using supplements eleven athletes use them for maintenance and nine athletes use them for recovery. Fifty percent of participants use supplements as protein. As per the result, 50% of participants are using supplements from the recommendation of their coaches and nutritional experts. Most of the participants are not using supplements may be due to a lack of knowledge, misleading information, improper guidance, and

all. The result indicates that the average intake of mackerel, sardine, tuna, salmon, shrimp, oyster, cauliflower, broccoli, walnut, flaxseeds, flaxseed oil, and soybean oil is less than three times or never in a month. Only red meat and egg were found to be eaten 2-4 times a week or once a week by the participants. From the results, it is confirmed that the consumption of omega-3 food items and omega-3 supplements is low among athletes. Similar results were shown that most NCAA division I athletes do not meet dietary recommendations for omega-3 fatty acids (P.Ritz et al., 2020). For the question of whether to take any omega-3 supplement out of 150 participants, only 14 are taking an omega-3 supplement. Most of them use fish oil supplement and consumes them 1-2 times per week. From the results, we can draw that sometimes the cause of getting injured and not overcoming it, high level of fatigue, and muscle soreness, may be the reason for low omega-3 index and having an adequate number of supplements to balance the needed amount of nutrients for the body.

Conclusions

In conclusion, the study showed that athletes are not getting an adequate amount of omega-3 fatty acids through their diet or not taking sufficient amounts of supplements. This may lead to a low recovery rate after strenuous activity or exercise-induced muscle damage. It is recommended to have a proper diet and intake of supplements for the betterment of health and performance. Further studies with a higher number of participants should be done for more information.

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