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Research Article

Differential Protein Content: A Comparative Study of Long-Distance Runners and Non-Sports Persons

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Abstract

Background: Protein plays an essential role in muscle tissue's repair, maintenance, and growth. Athletes, especially those involved in long-distance running, experience increased protein turnover because of the physical strain on their muscles, which requires a higher protein intake for effective recovery and adaptation. On the other hand, non-athletes have lower protein requirements due to their lesser physical activity and muscle demands. Analyzing the protein content between these two groups illustrates how physical activity affects protein metabolism, muscle health, and overall nutritional needs, providing valuable insights for customized dietary recommendations that can benefit both athletes and non-athletes.

Objective: To investigate the protein content among university-level long-distance runners and non-sports persons.

Study Design: This study utilized a cross-sectional design.

Material and Methods: Sixty (60) university-level students with long-distance runners (n = 30) and non-sports persons (n = 30) from Punjabi University Patiala were selected using a random sampling technique. To achieve the purpose of the study, the Body composition analyzer GS6.5B Body Building Weight Test System (Version 1.0) was used to measure the protein content of the subjects.

Results: The study found a significant difference in variable protein content between long-distance runners and non-sports persons. The t-value regarding protein content was 3.40 and the p-value was 0.001 and was found to be statistically significant at 0.05 level of significance $p<.05$.

Conclusion: This study compared the protein content between university-level long-distance runners and non-sports persons. The protein content of long-distance runners was lower than that of non-sports persons.

Keywords: Long-Distance Runners; Non-Sports Persons; Nutrition; Protein

Introduction

Protein is a crucial macronutrient essential for muscle repair, growth, and overall health. Protein is a class of nitrogen-containing compounds formed by amino acid [1]. Protein unlike carbohydrates and fats contains nitrogenous in summation to carbon, oxygen and hydrogen. Every cell requires protein factually, Proteins are found throughout the entire body with muscle tissue being the major location. Athletes consume dietary protein to repair and rebuild

skeletal muscle and connective tissues following intense training bouts or athletic events. During the 1980s and early 1990s [2-4] first demonstrated that total protein needs were 50 to 175% greater in athletes than sedentary controls.

Proteins are key macronutrients for maintaining good nutrition and health and are necessary for the proper functioning of the organism. Among these functions, proteins ensure growth in childhood, support muscle and bone metabolism, contribute to the maintenance of the nervous system, and help maintain muscle mass and physical performance in later life [5].

Recommended protein intakes for athletes undergoing daily training are a controversial issue. Suggested protein intakes range from those slightly above that for nonathletic individuals to values that are twice or even four times that amount. A number of factors could significantly influence the protein requirement for an athlete, including the state of training, the type and volume of training, the diet's energy density, and the diet's carbohydrate content [2].

Protein plays a crucial role in both maintaining and building skeletal muscle mass, especially among physically active groups like long-distance runners. Even though their protein requirements are heightened, many athletes struggle to meet these needs due to low energy availability (LEA) and misconceptions about nutrition. Inadequate protein consumption can adversely affect muscle recovery and overall performance. This research seeks to compare the protein intake of long-distance runners with that of non-sports persons to underscore the implications for nutritional strategies that enhance athletic performance and health in endurance athletes.

Materials and Methods

Selection of subjects

To achieve the objective of the study total of (60) university-level male students with long-distance runners (n = 30) and non-sports persons (n = 30) were selected. The age of the participants ranging from 18-25 years and were selected using a random sampling technique. To accomplish the objective of this study, interuniversity-level long-distance runners from Punjabi University Patiala were selected, and non-sports persons were recruited from the pharmacy and computer science departments (n = 30) of Punjabi University Patiala, Punjab. All the subjects were informed about the procedure and objective of the study, and after their consent, they willingly participated in this study.

Operational definitions

Long-Distance Runners: For the purposes of this study, long-distance runners are defined as athletes who regularly participate in running events of 3,000 meters or more. This ensures that participants are experienced in endurance running, which involves sustained aerobic effort [6].

Non-sports persons: Non-sports persons are defined as the individuals who do not participate in any type of sports activity [7].

Inclusion and exclusive criteria

Persons having any medical condition were excluded from the study. This study included long-distance runners who have participated in inter-university level competitions to assure that they are actively participating in endurance activity like long-distance running.

Variables	Long Distance Runners	Non-sports persons
Age	20.13 ± 1.99	22.1 ± 1.68
Height	172.12 ± 3.92	176 ± 3.1
Weight	59.47 ± 3.92	67.09 ± 2.08
BMI	20.06 ± 0.83	21.75 ± 1.01

Table 1: Showing the mean anthropometric data (M ± SD) of the participants.

Instrument used

Body composition analyser GS6.5B Body Building Weight Test System (Version 1.0) was used to measure the protein content of the subjects. The test was conducted in the physiology lab of the Department of Physical Education at Punjabi University Patiala. The subject was instructed to remove his shoes and socks to stand barefoot on the electrode part of the machine with both feet completely touching the required sites of the machine. Further, the subject was instructed to hold the electrodes in both hands with arms lying straight towards the ground until all the measurements are recorded by the machine. Finally, the readings were recorded and the data was carefully recorded [8,9].

Analysis and interpretation

The data was carefully recorded and descriptive statistical technique t test was employed to analyse the difference between the groups, the level of significance was set at 0.05. This study found that there exists a significant difference in protein content between long-distance runners and non-sports persons.

Table 2 shows that the mean and standard deviation (MEAN ± SD) regarding the protein content of Long-distance runners was 9.98 ± 0.9 and 10.76 ± 0.86 for non-sporting persons**.** The t-value regarding protein content was 3.40 and the p-value was 0.001 and was statistically significant at 0.05 level of significance p<.05.

Groups	N	MEAN	SD	SEM	T value	P value
Long-Distance Runners	30	9.98	0.9	0.16	3.40	0.001
Non-sports Persons	30	10.76	0.86	0.15		

Table 2: Showing the comparison of Protein (kg) content between long-distance runners and non-sports persons.

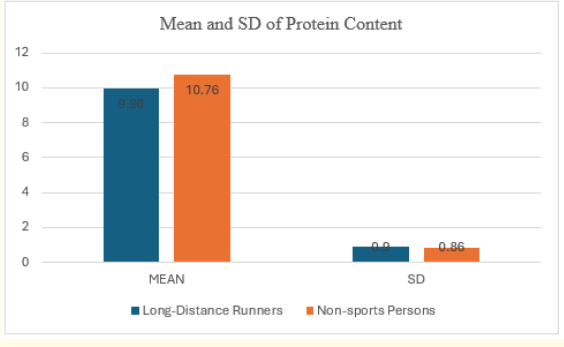

Figure 1: Showing The Mean and Standard Deviation of Long-Distance Runners and Non-sports Persons.

Discussion of Results

Long-distance runners had lower protein content in comparison with non-sports persons, this discrepancy may reflect the demands of protein metabolism in endurance athletes who commonly adopt a high-carbohydrate focus to support their energy requirements (and inadvertently restrict intake for muscle maintenance and repair) instead prioritizing carbohydrate consumption over that from other macronutrients like proteins [10]. Research suggests that runners need sufficient amounts of protein for recovery however, carbohydrate-centric dietary choices leave them under-consuming [11,12].

The muscle health of long-distance runners could also be compromised due to the lower protein content, as proteins are important for muscular repair and skeletal muscle mass maintenance [13]. On this subject, low protein intake along with reduced skeletal muscle mass and muscular strength or endurance may hinder performance [14-16]. This higher protein content in non-sports persons, on the other hand, may suggest a similar trend of being influenced by high-protein diets associated with weight management [17]. Although higher-protein diets like this can be beneficial for muscle maintenance, physical activity is necessary to improve health.

Further research alludes to the fact that long-distance runners may under consume due to performance demands which could only further compromise protein intake that can result in lower muscle mass and slow recovery [18]. Our results clearly indicate that there is a need for better nutritional education in endurance runners, and protein-balance may be an issue both among non-sports persons.

In conclusion, this study provides interesting data regarding the protein content of sports and non-sportive persons showing significant differences between the groups. The findings suggest that, in addition to physical activity levels, personalized nutritional requirements need also be tailored by diet and lifestyle profiles. Areas for future research include longitudinal studies determining whether dietary patterns and lifestyle choices have long-term effects on the adequacy of protein intake and health in the general population.

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