

ORIGINAL PAPER (ARTIGO ORIGINAL)

# A STUDY OF NUTRITIONAL KNOWLEDGE AND ATTITUDES OF ELITE COLLEGE ATHLETES IN IRAN

Mohammad Azizi<sup>1</sup>, Farhad Rahmani-Nia<sup>2</sup>, Maryam Malae<sup>3</sup>, Mina Malae<sup>4</sup>, Narges Khosravi<sup>4</sup>

<sup>1</sup>Department of Exercise physiology, University of Guilan, Iran.

<sup>2</sup>Professor in Exercise Physiology, University of Guilan, Iran.

<sup>3</sup>MSc in physical education and sport science, Azad University of Ardabil, Iran.

<sup>4</sup>MSc in Sport management, University of Guilan, Iran.

<sup>5</sup>MSc in Sport management, University of Tarbiat Moalem, Iran.

## Corresponding author:

Mohammad Azizi, PhD Candidate  
Department of Exercise physiology  
University of Guilan, Rasht, Iran  
P.O. Box: 1438  
Phone: 0098-131-6690685  
Cell-Phone: 0098-9183746103  
Fax: 0098-131-6690675  
E-mail: azizimhammad@gmail.com

Submitted for publication: January 2010

Accepted for publication: April 2010

## ABSTRACT

AZIZI, M.; RAHMANI-NIA, F.; MALAEE, M.; MALAEE, M.; KHOSRAVI, N. A study of Nutritional knowledge and attitudes of elite College Athletes in Iran. *Brazilian Journal of Biomotricity*, v. 4, n. 2, p. 105-112, 2010. This study designed for understanding the nutrition knowledge and attitude of elite college athletes in Iran. A researcher-built questionnaire which was developed to measure subject's nutrition knowledge and attitude, distributed to 297 female (age  $21.8 \pm 1.8$  years) and 298 males (age  $22.8 \pm 1.9$  years) randomly. The questionnaire contained 15 nutrition knowledge questions and 15 nutrition attitude questions. The collected data was analyzed by t-test, one-way ANOVA and Pearson correlation coefficient ( $p < 0.05$ ). The mean nutrition knowledge and attitude score for male and females was  $52.36 \pm 6.2$ ;  $50.61 \pm 5$  and  $54.3 \pm 6.3$ ;  $52.03 \pm 5.8$  respectively. Nutrition knowledge and attitude score in P.E. females was significantly higher than other major ( $p < 0.05$ ), while the difference between P.E. males and other major was not significant. There was a significant positive correlation between nutrition knowledge and attitude among males ( $r = 0.424$ ,  $p \leq 0.01$ ) and female ( $r = 0.422$ ,  $p \leq 0.01$ ) elite athletes. Based on the result of our study the knowledge of Iranian college athletes is moderate, and these suggest that nutrition knowledge and attitudes of Iranian college athletes need to improve.

**Key words:** Nutrition Knowledge, Attitudes, College Elite Athletes.

## INTRODUCTION

Diseases such as cancer, cardio vascular diseases, obesity and hypertension are strongly related to eating knowledge, behaviors and dietary practices (WILLET et al., 1994; TAVANI et al., 1995). Studies also indicated that individuals who have basic nutrition knowledge and attitude apply these principles when selecting foods. Therefore improving nutrition knowledge, attitude and dietary practices through nutritional education may help to prevent or mitigate the aforementioned diseases (CHANG et al., 1987; FEREDERICK et al., 1992; LISSNER et al., 1995).

College students are an appropriate target audience for nutrition education, because their lives are in transition and have the potential for positive changes (YUECHING et al. 1999). Several studies have reported that college students frequently have misconceptions about nutrition, fail to make nutrition a priority in food selection, and are poorly informed about dietary guidelines (FEREDERICK et al., 1992; Mitchell et al., 1990; JACOBSON et al., 2001).

Studies show that nutrition knowledge and attitudes have an effect on eating habits (RUKA et al., 2005; LAURIE et al., 2003). Ruka and colleague (2005) described, although 85.6% of students are aware of the concept of nutritionally balanced food, only a few number of students (7%) apply this concept when selecting food from a menu. Moreover, only 51% of students showed a desire to learn about healthy diets (RUKA et al., 2005). Previous studies indicated that nutrition is an important complement of any physical fitness program (RUKA et al., 2005; YUECHING et al. 1999; FEREDERICK et al., 1992). Nutritional needs for peak athletic performance include sufficient calorie intake, adequate hydration to timing of meals. Student athletes and their advisers often are misinformed or have misconception about sports nutrition (RUKA et al., 2005; LAURIE et al., 2003; NANCY et al., 2005).

Barr (1987) found that scores on the knowledge test were 34% in women athletes. Among students age, education, dietary pattern, total number of nutrition information sources, and length of time an activity program had been maintained were positively associated with nutrition knowledge (BARR, 1987). Research suggest that adolescent athlete is neither aware of nor prepared for the dual demands of sound nutritional practices in general and those demanded by his or her chosen sport activities (LAURIE et al., 2003; SCHMALZ et al., 1993). The dietary practices of young athlete fail to meet the energy requirement for high performance and may also threaten their well-being (NANCY et al., 2005). Schmalz (1993) showed that students were consuming excessive fats and sugar, and failed to recognize nutritional practices critical to the demands of athletes (SCHMALZ et al., 1993). Jacobson et al. (2001) survey results indicated that only 3, 11.7 and 29.5% correctly identified recommended percents of total calorie intake for protein, fat and carbohydrates, respectively; 37% correctly identified the role of vitamins and 54.4% for protein. (JACOBSON et al., 2001) Studies have indicated that males (85%) and females (87%) advised young overweight adolescents to diet to lose weight; 20% of females and 13% of male regularly skipped breakfast. The advice given showed a lack of specific nutrition education about weight control, adolescent's nutritional needs, and fat diet (SMITCH-ROCKwell et al., 2001; ODEA et al., 2001).

Studies have indicated that athlete appears to have positive attitudes toward nutrition (YUECHING et al., 1999; JACOBSON et al., 2001; RUKA et al., 2005). This suggests that if the areas of knowledge deficits or reasons for nutritional choices can be identified, the college athletes will be receptive to nutrition education; and moreover, due to lake of enough information about nutrition knowledge and attitude of college athletes in Iran, the purpose of this study was to obtain a better understanding of the current nutrition knowledge and attitudes of elite college athletes in Iran.



## MATERIAL AND METHODS

The target population consisted entirely of elite college athletes that participated in 8<sup>th</sup> College Sport Olympiad in Kerman-Iran [College students' sport Olympiad is the most important national sport competition between elite college athletes in Iran that is held every 2 years]. 650 questionnaires randomly were distributed between college athletes initially. Out of these, 298 questionnaires for males (age  $22.8 \pm 1.9$  years; height  $177.3 \pm 5.8$  cm; weight  $75.3 \pm 10.9$  kg) and 297 questionnaires for females (age  $21.8 \pm 1.8$  years; height  $165.4 \pm 6.4$  cm; weight  $57.2 \pm 7.6$  kg) were completely filled out and returned.

A researcher-built questionnaire was developed to measure student's nutrition knowledge and attitudes. Basic demographic information such as gender, height and weight also included. The questionnaire was divided into 2 major sections: knowledge and attitude. The knowledge section contained 15 questions that were assessed on a 5-points scale (from strongly agree to strongly disagree). The questionnaire was evaluated by professional faculty of physical education and sport sciences. Reviewers were asked to comment on content, clarity and construction of the questionnaire. Items on the questionnaire were revised to incorporate the reviewer's suggestions.

Thirty college athlete students participated in a pilot test of the revised questionnaire. After completing the questionnaire, they were interviewed about the clarity and relevance of each item. On the basis of comments and responses collected during the pilot test, minor revisions were made to the questionnaire, and the data collection instrument was refined. The reliability analysis yielded Cronbach Alpha values of 0.85 for the knowledge test and 0.83 for the attitude scale. An institutional ethics review board at University of Guilan-Iran approved this study.

Measures, standard deviation and percents were calculated for the scores from the nutrition knowledge and attitude sections. Pearson's correlation coefficient were used to assess the correlation between nutrition knowledge and attitude of college athletes; and analysis of variations (ANOVA) to evaluate the nutrition knowledge and attitude between majors, and independent t-test for comparing the nutrition knowledge and attitude between males and females. Statistical results were considered to be significant at  $p \leq 0.05$ .

## RESULTS

The mean (SD) score for nutrition knowledge of males and females were  $52.36 \pm 6.7$  and  $54.31 \pm 6.3$  which presents a 57.3% and 60.4% corrected response rate respectively (Table 1). For the physical education, science, literature, engineering and agriculture majors, the mean knowledge scores was 52.24, 52.42, 52.74, 52.04 and 52.59 respectively. There was no significant differences for knowledge score among all majors in males athlete ( $F = 0.972$ ,  $p = 0.423$ ). On the contrary, physical education females had the highest (56.32) knowledge scores among all majors ( $F = 6.8$ ,  $p = 0.0005$ ), and there were no significant differences in nutrition knowledge between non-physical education major students. The results indicated that females had a significantly higher nutrition knowledge score than males ( $p < 0.05$ ).

**Table 1** - Nutrition knowledge and attitude score for elite college athletes

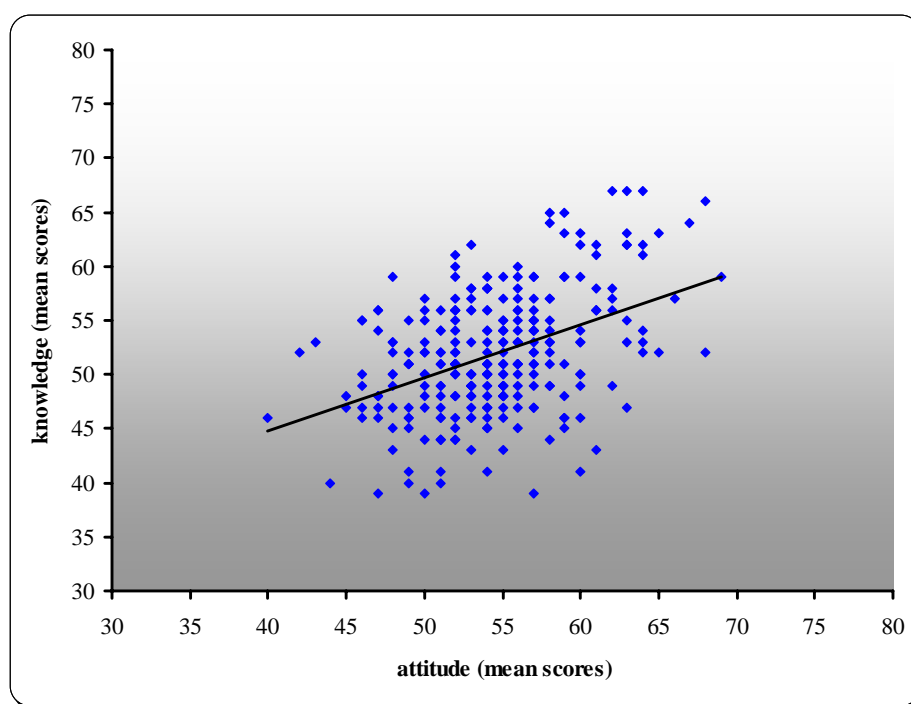
Majors	Male		Female		
	Score	Correct response (%)	Score	Correct response (%)	
<b>Knowledge</b>	Physical Education	52.24	57.31	56.32 <sup>a</sup>	61.84
	Science	52.48	57.61	52.57 <sup>a</sup>	57.72
	Literature	52.74	57.81	53.38 <sup>a</sup>	58.61
	Engineering	52.04	57.12	53.18 <sup>a</sup>	58.33
	Agriculture	52.59	57.72	52.52 <sup>a</sup>	57.67
<b>Mean</b>	52.36±6.7*	57.36	54.31±6.3*	60.42	
<b>Attitude</b>	Physical Education	51.58 <sup>a</sup>	56.64	53.11 <sup>a</sup>	58.22
	Science	49.92	54.81	52.50 <sup>a</sup>	57.56
	Literature	49.27 <sup>a</sup>	54.08	50.57 <sup>a</sup>	55.53
	Engineering	50.76	55.74	50.81 <sup>a</sup>	55.79
	Agriculture	49.55	54.41	50.44 <sup>a</sup>	55.38
<b>Mean</b>	50.61±5.1*	55.84	52.03±5.8*	57.12	

<sup>a</sup>: significant difference between Physical Education and other majors

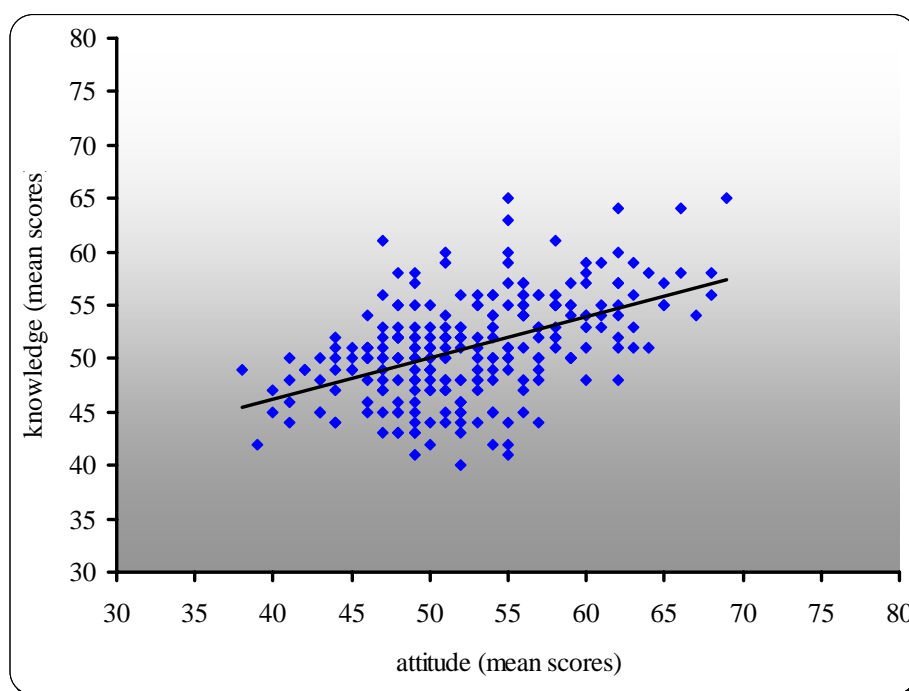
\*: significant difference between male and females

The mean score for nutrition attitude in males and females was  $50.61 \pm 5.1$  and  $52.03 \pm 5.8$ ; which represented 55.84% and 57.12% corrected response rate (Table 1). Although, mean scores of nutrition attitude in physical education males was higher than other majors, but this difference just between physical education and literature was significant. Nutrition attitude scores of female students studying physical education, was significantly higher than females participants from other subject majors ( $53.11$  vs.  $51.08$ ;  $p \leq 0.05$ ).

The results show that 95 percent of males and 96.3 percent of females were strongly agreed or agreed that "It is important to have breakfast every day". 47.3 percent of males and 50.5 percent of females were strongly disagreed or disagreed with this statement that "Sauna is the best way for weight control (decrease weight)"; while 30.5 percent of males and 18.5 percent of females were strongly agreed or agreed that sauna is the best way for weight control. The results show that there was significant differences between nutrition knowledge ( $t = 4.68$ ,  $p = 0.0005$ ) and attitude ( $t = 2.66$ ,  $p = 0.008$ ) of female and male College athletes. There was a significant positive correlation between nutrition knowledge and attitude among males ( $r = 0.424$ ,  $p \leq 0.01$ ) and females ( $r = 0.422$ ,  $p \leq 0.01$ ) (figures 1 and 2).



**Figure 1** - Correlation between knowledge and attitude in college elite female athletes



**Figure 2** - Correlation between knowledge and attitude in college elite male athletes

## DISCUSSION

This study aimed to determine the nutritional knowledge and attitudes of elite college athletes in Iran. Recent research suggests that the adolescent athlete is neither aware of nor prepared for the dual demands of sound nutritional practices in general, nor those demands by his or her chosen sport activities (LAURIE et al, 2003; SCHMALZ et al., 1993). College athletes have misconception about nutrition, and have poor nutrition knowledge and attitude (YUECHING et al. 1999; LAURIE et al., 2003; NANCY et al., 2005; SCHMALZ et al., 1993). The present study found that college athletes in Iran have moderate nutrition knowledge (57.36% and 60.42% correct response rate for males and females, respectively). These result support the study of Laurie, Yueching and Jannalagada, which found that college athletes have not enough knowledge about nutrition (YUECHING et al. 1999; JONNALAGADDA et al., 2001).

As expected this study found that athletes varied in their nutrition knowledge depending on their college majors. Nutrition knowledge scores of females students studying physical education, was significantly higher than females participants from other subject majors. These data are similar to the study done by Chang, Georgia and Yoeching, which indicating that student's nutrition knowledge is related to their majors (YUECHING et al. 1999; CHANG et al., 1987; GEORGIA et al., 1993). However related courses such as exercise physiology, sport nutrition and exercise science are required for physical education students. A background in exercise physiology, sport nutrition and exercise science may be one of the reasons for better performances on the knowledge test, but possible relationship between nutrition knowledge and these courses needs further investigation.

Providing a nutrition or nutrition-related course to non-physical education college students may be one way to increase their nutrition knowledge and therefore, positively influence dietary behaviors. Pervious studies found that collegiate athletes, who completed a nutrition course in college, demonstrated greater nutritional knowledge than those who did

not complete a nutrition course. Our study's data support this finding, suggesting that athletes may benefit from taking a nutrition course or from receiving additional information for optimal health and performance (LAURIE et al., 2003; BARR, 1987).

Nutrition attitude scores of female physical education athletes were significantly higher than literature, engineering and agriculture majors. Also nutrition attitude scores of male physical education athletes were higher than other majors, but this difference just between physical education and literature was significant.

Georgia and colleagues (1993) reported that nutrition knowledge was not related to gender (GEORGIA et al., 1993). In contrast, we found that female athletes had a significantly higher knowledge and attitude score than male athletes. This is similar to Yoeching et al. (1999) study, which indicated female students, had higher nutrition knowledge scores, and better nutrition attitude than male students (YOECHING et al., 1999). It suggests that females in general are more concerned about their nutrition and health than males.

Nutrition knowledge was positively correlated with nutrition attitudes; studies showed that knowledge can affect nutrition attitude (10, 17). We found that nutrition knowledge and attitudes in male ( $r= 0.424$ ,  $p \leq 0.01$ ) and female athletes ( $r= 0.422$ ,  $p \leq 0.01$ ) were positively correlated. Significant positive correlation between nutrition knowledge and attitude were also reported in Schwartz and Yueching studies (YOECHING et al., 1999; SCHWARTZ et al., 1976).

Ruka and colleagues reported that the majority of students (83.6%) taking meals regularly, with 79% eating meal 3 times per day (RUKA et al., 2005). In contrast, a dietary survey of young Japanese subjects revealed a low rate of individuals engaged in regular eating patterns (MINISTRY of HEALTH, 2002). The skipping of breakfast has been associated with lower nutritional status and the risk of cardiovascular disease (SMITH-ROCKWELL et al., 2001). It also has been reported that less adequate breakfast habits may contribute to the appearance and further development of obesity (YUECHING et al., 1999; ODEA et al., 2001). Therefore the importance of regular eating patterns can not be overemphasized in nutritional education.

Our study indicated that 95% of males and 96.3% of females strongly agreed or agreed that "It is important to have breakfast every day". These result supports by the study of Yueching and colleague, which reported that 82% of students strongly agreed or agreed that "It is necessary to have breakfast every day" (YUECHING et al., 1999).

## PRACTICAL APPLICATIONS

This study represents a first step in identifying the current nutrition knowledge and attitudes of elite college athletes in Iran. Based on the result of our study the knowledge of Iranian college athletes is moderate in comparison to student from other countries, and these suggest that nutrition knowledge and attitudes of Iranian college athletes need to improve. So, improving a nutrition education program for non-physical education majors could be an effective way to improve college athlete's nutrition knowledge and attitudes. The importance of nutrition in various college curriculums and improvement of the learning environment, relate to nutrition need to be emphasized on college campuses.

## REFERENCES

BARR, S. I. Nutrition knowledge of female varsity athletes and university students. *Journal of American Dietetic Association*, v. 87, p.1660-1664, 1987.



- CHANG, S. L. Survey on health knowledge of college students in the middle area of Taiwan. *Public Health*, v. 14, p. 250-273, 1987.
- FREDERICK, L.; HAWKINS, S. T. A comparison of nutrition knowledge and attitudes, dietary practices, and bone densities of postmenopausal women, female college athletes and nonathletic college women. *Journal of American Dietetic Association*, v. 92: p. 199-205, 1992.
- GEORGIA, S.; GULDAN, Y. W.; LIN, Y.; ZHAO, M.; XIANG, D. P.; YANG, L.; LONG, F. Evaluation of a nutrition education activity for medical student in china. *Asia Pacific Journal of Clinical Nutrition*, v. 2, p. 71-76, 1993.
- JACOBSON, B. H.; SOBONYA, C.; RANSONE, J. Nutrition practices and knowledge of college varsity athletes: a follow-up. *Journal of Strength and Conditioning Research*, v. 15, p. 63-68, 2001.
- JONNALAGADDA, S. S.; ROSENBLOOM, C. A.; SKINNER, R. Dietary practices, attitudes, and physiological status of collegiate freshman football players. *Journal of Strength and Conditioning Research*, v.15: p.507-513, 2001.
- LAURIE, G.; ZAWILA, C.; STEIBT, B. The female collegiate cross-country runner: nutritional knowledge and attitudes. *Journal of Athletic Training*, v. 38, p. 67-74, 2003.
- LISSNER, L.; HEITMANN, B. L. Dietary fat and obesity: evidence from epidemiology. *European Journal of Clinical Nutrition*, v. 49, p. 79-90, 1995.
- MINISTRY OF HEALTH, LABOUR AND WELFARE. The nutrition survey in Japan. Daiichi publisher, 2002.
- MITCHELL, S. J. Changes after taking a college basic nutrition course. *Journal of American Dietetic Association*, v. 90, p.955-961, 1990.
- NANCY, C.; CONNIE, E.; VICKERY, R. D.; MCBEE, S. Sports Nutrition for Young Athletes. *Journal of School Nurses*, v. 21, p. 323–328, 2005.
- O'DEA, J.; ABRAHAM, S. *Knowledge, beliefs, attitudes, and behaviors related to weight control, eating disorders, and body image in Australian trainee home economics and physical education teachers. Journal of Nutrition Education*, v. 33, p. 332-340, 2001.
- RUKA, S.; TOYAMA, K.; AMAMOTO, R.; LIU, C. H.; SHINFUKU, N. Nutritional knowledge, food habits and health attitude of Chinese university students—a cross sectional study. *Journal of Nutrition*, v. 4, p. 1475-1480, 2005.
- SCHMALZ, K. Nutrition beliefs and practices of adolescent athlete's. *Journal of School Nurses*, v. 9, p. 18-22. 1993.
- SCHWARTZ, N. E. Nutrition knowledge, attitudes and practices of Canadian public health nurses. *Journal of Nutrition Education*, v. 8, p. 28-31, 1976.
- SMITH-ROCKWELL, M.; NICKOLS-RICHARDSON, S. M.; THYE, F. W. Nutrition knowledge, opinions, and practices of coaches and athletic trainers at a division 1 university. *International Journal of Sport Nutrition and Exercise Metabolism*, v. 11, p.174-185, 2001.
- TAVANI, A.; LA VECCHIA, C. Fruit and vegetable consumption and cancer risk in a Mediterranean population. *American Journal of Clinical Nutrition*, v. 61; 374-377, 1995.
- WILLETT, W. C. Diet and health: What should we eat? *Science*, v. 264, p. 532-537, 1994.
- YUECHING, W.; YI-CHIA, H. Is the College environment adequate for accessing to nutrition education: A study in Taiwan. *Nutrition Research*, v. 19; p. 1327-1337,1999.