

Review Article

Review on Essential Sports Nutrient Knowledge for College Students Engaging in Physical Activities

Fuming Gu

Department of Sports Medicine, Chengdu Sport University, Chengdu, 610041, China

Abstract: The aim of this study was to review the essential sports nutrient knowledge for college students engaging in physical activities and give some suggestion on college students and teachers. In the reviewed literature, many researchers indicated that sports science is more and more paid close interest by college students and physical education teachers and sports nutrition has a direct benefit of the scientific concept of nutrition for students in exercise training. This study summarized some essential nutrient knowledge which the college students and physical education teachers should know and to provide some practical experience with those who do physical fitness college students on sports nutrition issues. It not only give helps to the usual self-management college students on nutrition, but also to those who are training he college students those who are researching on the physical fitness of college students.

Keywords: College students, nutrient knowledge, sports foods, sports nutrition

INTRODUCTION

There are many researchers have performed some research of nutrition on college student, for example, after examining the association between college students' dietary patterns and frequency of purchasing food/beverages from campus area venues, purchasing fast food and bringing food from home, Some studies (Pelletier and Laska, 2013) indicated that increasing the healthfulness of campus food environments and promoting healthy food and beverage purchasing around campuses may be an important target for nutrition promotion among college students. A investigation (King *et al.*, 2013) determined whether residency (living on campus versus off campus) was related to the effects of Fit into College on students' health behaviors and to understand interns' perceptions of their roles in mentoring their trainees. The findings of this study have concluded that future iterations of fit into college may focus on improving college students' planning and preparation of healthy foods, segmenting trainees into more homogeneous groups for the interns to tailor their areas of expertise (campus vs. off-campus and/or freshman vs. Upper class students) and collaborating with university-partners to improve environmental conditions to promote physical activity and healthy nutrition. Wilkinson *et al.* (2014) examined PETE students' perceptions of a Healthy and Active Lifestyle (HAL). Following inductive content analysis of interview data and field notes, a model including several themes and categories emerged. Knowledge of HALM led to students developing views of a HAL,

which influenced their HAL behaviors. Other social influences had a positive or negative effect on students' HAL behavior. Students were mostly autonomously motivated to exercise, but many were extrinsically motivated in their diets. Azizi *et al.* (2011) developed a standard questionnaire to measure the participant's nutrition knowledge, attitude and practices, the study indicated that there was a positive and significant correlation between the nutrition knowledge and attitude of the female and male students; and a positive and significant correlation between the nutrition attitude and practices of male and female students. Research of Ferrara *et al.* (2013) indicated that there was a trend for no health-related (NH) college student to be overweight or obese compared to health-related college students and there was no difference in the percentage of HM and NH who participated in moderate aerobic exercise five or more days per week, but HM ate more servings of fruits and vegetables and were more likely to eat five or more servings daily. Yoon *et al.* (2014) compared and investigated the effect of residence on the levels of physical activity, diet patterns and health-related habits between college freshmen who live on and off-campus. The study concluded that physical activity can be affected by where they live for both genders. Drinking habits and dietary patterns can be affected by their residence, especially for female students. Kicklighter *et al.* (2010) study revealed that students desired information that could be integrated into a college student's lifestyle. Avram and Oravitan (2013) established the prevalence of fruit, vegetables and fast food consumption among students from Timisoara

university center and provide evidence based information for increasing healthy food choices in order to prevent cardiovascular diseases. Bryant *et al.* (2012) investigated college students' behaviors in response to the calories ingested by drinking alcohol. Reed *et al.* (2011) examined the impact of "point of decision" messages on fruit selection in college students in a single dining hall setting. Peterson *et al.* (2010) determined the effects of a short-term, multi-faceted, point-of-selection intervention on college students' perceptions and selection of 10 targeted healthful foods in a university dining hall and changes in their self-reported overall eating behaviors. Freedman (2010) developed, evaluated and validated two nutrition environment assessment tools, for specific use in combating overweight on college campuses.

MATERIALS AND METHODS

After reviewing related literature in the library of Chengdu Sport University in June 2015, Using literature review method, export interview and other scientific research method the authors explored the essential sports nutrient knowledge for college students engaging in physical activities.

RESULTS AND DISCUSSION

The purpose of this study was to make a brief review on the essential nutrition knowledge for the college students and physical education teachers, including the importance of the existing issues that may arise in the college students engaging physical activities, balanced diet and the essential knowledge for the nutrition intake.

Nutrition problems in sports activities of college students: Many college students and even college sports teachers or coaches adopt some special diet formulas which may be effective for sports activities, but some may cause side effects. Therefore, it is recommended that these special diet methods be verified by scientific methods besides the so-called empirical rules before being used, so as to confirm their safety and effectiveness, which causes less biases or health hazards. Approximately the following problems exist in the diets of college students who take sports activities:

Unreasonable diet structures:

Excessive protein intake: Not knowing how to control protein intake, they may take in too much protein, which may increase uric acid, cause liver and kidney burden, increase body fat and cause calcium excretion, etc.

Excessive fat intake: College students are used to eating carnivorous food, which causes too much food fat intake, thus causing weight gain, too high body fat

proportion and blood fat and even decreasing cardio-pulmonary function, etc.

Too little water intake: Many college students haven't the habit of supplementing water during sports activities, while lack of water in the body is likely to influence metabolism, body temperature regulation, energy synthesis, anaerobic metabolism, etc. and even cause heat exhaustion and shock to endanger life safety.

Inadequate vegetable and fruit intake leads to inadequate vitamin, minerals and fiber and so on in the body, which influences metabolism and gastrointestinal motility, causes bad bowl evacuation habit, etc.

Incorrect weight reduction methods: Many college students, particularly female students often adopt dehydration method in order to reach the ideal weight rapidly: they adopt the sweating method, don't drink water and wear air proof clothes so as to sweat copiously during running; they reduce weight by adopting way of fast, eating diet pills, adopting high protein diet method, etc. And some students reduce calorie intake by not eating rice, which tends to cause energy shortage so as to cause body muscle wasting, muscular soreness, exhaustion, etc. These incorrect methods may reduce weight, but they cause metabolic disorders, muscle wasting and organ damages severely, thus influencing fitness and sport performance.

Deviated health management: It includes sports anemia, iron-deficiency anemia, chronic fatigue, excessive free radicals in the body, etc. which are likely to show in college students. However, from the perspective of sports nutrition, these problems will be improved by adopting a balanced diet or supplementing proper nutrients. For example, besides iron, other nutrients like vitamin C, vitamin B12, folic acid, manganese, copper and so on are actually required for anemia. Irony alone is not enough and suggestions should be made after identifying the causes so as to prevent excessive chalybeate supplement from causing iron pigmentation.

Current diet survey on college students shows inadequate intake of calories, carbohydrates and some micronutrients in the diet of college students. Influenced by the general mood of society, female students deliberately control their weight by incorrect methods, which may cause inadequate bone density, fatigue, sport injuries and reduced sport performance and may even cause menstruation disorders. Besides, habituation absorption of midnight snack, dessert, snacks and beverage is another reason why the weight of college students is difficult to control.

Importance of balanced diets: When comes to the relation between the balanced diet and sports, we should make clear what the balanced healthy diet is in the first place. Various foods provide bodies with various nutrients, including carbohydrates, protein, fat, vitamins, minerals and water. However, food we eat every day

may contain different nutritional ingredients. Any food cannot contain all nutrients our body needs. Therefore, only by matching food in a reasonable manner can our body obtain more comprehensive nutrients. Healthy adults should take in 6 categories of foods every day, i.e., grains and tubers (mainly providing accharides and some protein), fish, beans and eggs (providing rich protein), dairy (providing protein and rich calcium), vegetables (providing vitamins, minerals and fiber), fruits (providing vitamins, minerals and fiber) and grease (providing calories).

Saccharides are carbohydrates, mainly providing energy and maintaining brain normal functions. Fiber is also a kind of saccharides. According to the current studies, fiber helps reduce blood fat, improve colony ecology of gastrointestinal tract, prevent constipation, reduce cancer incidence, etc. Besides providing energy and maintaining materials required for body growth and development and repair of damaged cells, protein is also required for the immune system, transport system in the body, blood cell system and enzymes in the body. For college students, muscle growth and construction is more important. For the same reason, college students tend to take in too much protein, which results in other side effects. Attention must be paid. Fat is also the energy source. Fat protects the internal organs, keep body temperature, promote the absorption of fat-soluble vitamins. And cholesterol in lipid is important component of cytomembrane. Vitamins and minerals participate in the body metabolism, enzyme activity, energy metabolism and acid-base balance and other actions, so they have a close relation with fatigue elimination and strength restoration. Water can regulate body temperature and eliminate metabolic wastes. For college students who take physical exercises, abundant attention should be paid to the nutrition absorption because people who take exercises need more nutrition than ordinary people. Besides diversity and balance of diet, proper nutrition supplements can be chosen when necessary, which will help restore strength and promote metabolism of lactic acid in an effective manner.

Balanced diets improve athletic ability: Many college students remove most saccharides from the diet during the weight reduction. The diet is so unbalanced that it greatly influences fitness and athletic ability. In fact, the brain is very difficult to work in the absence of carbohydrates. Meanwhile, carbohydrates are important sources of energy, while muscle glycogen is very important for extension of metabolism in the body. Exercise scientists think that increasing muscle glycogen storage can improve the athletic ability of college students from two aspects: exercise intensity and duration.

Many facts have shown that people who eat food that contains high carbohydrates can have a better sport performance, especially in endurance sports. Therefore, it is necessary for college students to store adequate glycogen for use before having sports activities. Most college students know the advantages of storing

glycogen in endurance sports; in fact, glycogen is important for intense exercises because the lack of glycogen means the muscles will only supply energy in the form of fat. However, the problem is that fat burning needs more oxygen, while oxygen supply in the body is limited. Therefore, fat burning cannot quickly, immediately provide energy to satisfy the needs of high intensity exercises, thus may affect sport performance. Therefore, some coaches may regard excessive glycogen supplement as the secret weapon for improving the athletic ability. Other studies suggest that taking in high carbohydrates before exercises and matching with medium-chain fatty acid can save the consumption of glycogen in the body and extend the endurance. This method is also useful for the college students' physical exercise diet.

Most scholars believe that the long-term lack of nutrients has a bad influence on sports activities. Since vitamins and minerals are associated with energy synthesis and metabolism and the activity level of college students is often greater than that of average adults and more nutrients are consumed in order to provide energy, it is recommended that they should take in diverse and more vitamins, especially for those female students who want to reduce weight. More special attention should be paid to the supplement of compound vitamins, as while controlling food caloric intake, nutrient absorption is relatively reduced, which affects the metabolism and fat burning. College students are expected to understand the above mentioned descriptions. Not only the balanced diet is important, but eating correctly can improve the athletic ability to a greater extent.

Methods for healthy and balanced diets In general, college students' nutrition should meet the following requirements:

- College students' dietary nutrients should be complete and absorbed calories should be adjusted in accordance with the sports demands, but should not be excessive or inadequate. If possible, you can consult nutrition experts for advice and take in appropriate nutritional supplements.
- College students should adopt healthy, fresh and varied diet in combination with color, aroma and taste, which can not only promote college students' appetite, help digest and absorb, but also provide all kinds of nutrients.
- Way of cooking in college students' diet should be corrected in a timely manner, so as to retain the nutrients in the food, reduce the damages during cooking and provide the college students with enough nutrients; besides, controlling fat level and reducing additives are also required.

Food distribution in three meals every day should be adjusted according to the college students' sports

activities. Many meals with a small amount or more flexible meal time can be adopted when necessary. College students should consider their calories and nutrients taken in will be greater than demands of average adults when they have sports activities according to the amount of exercise.

CONCLUSION

Good nutritional status can improve the results and health level of college students' sports activities. Excessive or inadequate nutrition intake can have negative influence on college students' sports activities. This study is intended for providing college students with some information about diet, hoping it is helpful for college students' sports activities and health maintenance.

ACKNOWLEDGMENT

This study was supported by the Sports Medicine key laboratory of General Administration of Sport of China/Sports Medicine key laboratory of Sichuan Province Foundation (No: 2014CTYY008).

REFERENCES

- Avram, C. and M. Oravitan, 2013. Fruit, vegetables and fast food consumption among university students. *Timisoara Phys. Educ. Rehabil. J.*, 5(10): 54-60.
- Azizi, M., N. Aghaee, M. Ebrahimi and K. Ranjbar, 2011. Nutrition knowledge, the attitude and practices of college students. *Phys. Educ. Sport*, 9(3): 349-357.
- Bryant, J.B., J. Darkes and C. Rahal, 2012. College students' compensatory eating and behaviors in response to alcohol consumption. *J. Am. Coll. Health*, 60(5): 350-356.
- Ferrara, C., C. Nobrega and F. Dulfan, 2013. Obesity, diet, and physical activity behaviors of students in health-related professions. *Coll. Student J.*, 47(3): 560-565.
- Freedman, M.R., 2010. Development, evaluation, and validation of environmental assessment tools to evaluate the college nutrition environment. *J. Am. Coll. Health*, 58(6): 565-568.
- Kicklighter, J.R., V.J. Koonce, C.A. Rosenbloom and N.E. Commander, 2010. College freshmen perceptions of effective and ineffective aspects of nutrition education. *J. Am. Coll. Health*, 59(2): 98-104.
- King, K.M., J. Ling, L. Ridner, D. Jacks, K.S. Newton and R. Topp, 2013. Fit into college II: Physical activity and nutrition behavior effectiveness and programming recommendations. *Recreat. Sport. J.*, 37(1): 29-41.
- Pelletier, J.E. and M.N. Laska, 2013. Campus food and beverage purchases are associated with indicators of diet quality in college students living off campus. *Am. J. Health Promot.*, 28(2): 80-87.
- Peterson, S., D.P. Duncan, D.B. Null, S.L. Roth and L. Gill, 2010. Positive changes in perceptions and selections of healthful foods by college students after a short-term point-of-selection intervention at a dining hall. *J. Am. Coll. Health*, 58(5): 425-431.
- Reed, J.A., A. Powers, M. Greenwood, W. Smith and R. Underwood, 2011. Using "point of decision" messages to intervene on college students' eating behaviors. *Am. J. Health Promot.*, 25(5): 298-300.
- Wilkinson, C., T. Pennington, D. Barney, B. Lockhart, R. Hager and K. Prusak, 2014. PETE students' perceptions of a healthy and active lifestyle. *Phys. Educ.*, 71(4): 644-659.
- Yoon, A., K. Kijeong and L. Sukho, 2014. The effects of residence on the eating and exercise habits of college freshmen in US. *Int. J. Appl. Sports Sci.*, 26(1): 1-10.