

The Implementation of Nutrition Education “Athena” for Improving Students’ Knowledge of Nutrition

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Abstract—Athlete’s Nutritional status was one contributing factor for athlete endurance. Nutritional status is influenced by many factor such as nutritional knowledge. Based on preliminary research, more than a half respondent (69%) of college athlete students from Indonesia University of Education has poor nutrition knowledge. The aim of this study was to implement nutrition education “ATHENA” for improving nutrition knowledge of college athlete students. The design of this study used quasi experiment with pretest-posttest control group. Sampling technique was done by purposive, and there were 46 college athlete students which were divided in two group, treatment group and control group. Nutrition education program was conducted in six weeks. The program includes nutrition for athlete, eating disorder in Athlete, effective exercise, handling depressive during exercise, and drugs use in sports. The program was delivered after or during the athlete exercise. The result showed that “ATHENA“ program has successfully improved nutrition knowledge of treatment group.

Keywords—Nutrition Education; ATHENA (Athlete Targeting Healthy Exercise and Nutrition Alternatives); College Athlete Students

I. INTRODUCTION

The nutritional status is a reflection of the fulfillment of nutrients needed in the body. Good nutritional status is expected to be able to maintain the stamina of athlete. Nutritional status of athlete correlates with athlete endurance [1]. Many factor affecting health and nutritional status of athlete. Eating disorder is one of the problems affecting nutritional status of athlete. Eating disorder in female athlete can lead to malnutrition, which results in physiological changes, dry skin, brittle nails and hair, amenorrhea, menstrual disorders, constipation [2]. Athlete with eating disorder will have poor nutritional status. This situation will lead the athlete decrease their physical activity and performance [3]

Female athlete are more at risk for eating disorders compared with male athlete [4][5][6]. In Indonesia, eating

disorder case was found in PUSDIKLAT Ragunan at Jakarta. From total 65 female athlete, 23.1% was categorized Bulimia. Eating disorder can occur in athlete who received the high pressure from their trainers to lose weight for appearance reasons [7]. The type of sport that makes athlete at risk from eating disorders are gymnastics, wrestling, swimming, and sports that require a certain weight and body shape [8].

Eating Disorder in Athlete should not occur if they have good knowledge about nutrition. Good nutrition knowledge can influence athlete’s nutrition behavior. There were positive correlation between nutrition Knowledge and nutrition behavior among male and female athlete in Iran [9]. Good nutrition knowledge also will greatly affect the eating habits of athlete. There were a positive correlation between knowledge and eating habits among athlete in California [10]. Better knowledge about nutrition will affect someone food choices and they will consume nutritious foods in terms of quality and quantity.

Many studies have developed to enhance nutrition knowledge of athlete. Nutrition education improved nutrition knowledge and it is useful in improving dietary intake [11]. One of successful health and nutrition education in improving nutrition knowledge and behavior of athlete is *ATHENA (Athlete Targeting Healthy Exercise and Nutrition Alternatives)*. In short-term study, the *ATHENA* program succeeded in its curriculum objectives and achieved a decrement in disordered eating practices and body-shaping drug use [12]. In long term study *ATHENA* program are an effective new paradigm to promote healthy lifestyles and prevent harmful behaviors [13].

Preliminary study in nutrition knowledge among athlete in Indonesia University of Education has been done. The result showed that 69% of respondents have less nutritional knowledge [14]. According to that result, nutrition education for improving nutrition knowledge among athlete in Indonesia University of education is a must, because if the athlete has better nutrition knowledge, their eating habit will be good and

it will contribute to their nutritional and health status for better performance.

The aimed of this study was to implemented nutrition education “ATHENA” for improving nutrition knowledge of college athlete student.

II. METHOD

This method of this study was quasi experiment. The design of this study is a nonequivalent control group. In this design the observation carried out by researchers 1 times. The first time it was before the experimental observation (pre - test) and after the experiment (post - test). In this study the researchers used two classes , one class as the control class is the class that does not undergo treatment (not given nutrition education ATHENA) and the experimental class is a class that is getting treatment (given nutrition education ATHENA). Subject in this study was college student athlete from Faculty of Sport and Health education. There were 46 student were divided in two group. There were 23 students in treatment group and 23 students in control group.

Nutritional education for athlete named ATHENA (Athlete Targeting Healthy Exercise and Nutrition Alternatives) is a nutrition education that aims to improve the nutritional knowledge of athlete , in particular knowledge of the eating disorder , knowledge about adequate nutrition during training , pre- competition and during the competition and after the competition. It also aims to provide knowledge to the athlete about the use of drugs in athlete, knowledge about effective practice and providing knowledge how to deal with stress during training and competition.

ATHENA implementation of nutrition education was held for seven weeks. Each meeting is held for 1x 60 minutes of face-to- face. The meeting was conducted after the athlete done the regular exercise. The subject matter in every meeting was: knowledge about eating disorder, balanced nutrition for athlete, effective exercise, ergogenic aid in sport, preventing depression in athlete. Each subject delivered by the expert with different method and using variety of media.

The data used in this study was athlete nutrition knowledge, using true false test. There were five subject matters. The question for each subject was ten questions. The score for true answer was 1 and for the wrong answer was 0. The knowledge was categorized in three category, good if the percentage > 80, fair if the percentage between 60-79 and poor if the percentage < 60 [15]. Hypothesis in this study were the researcher wants to find differences in learning outcomes between the experimental group and the control group. To prove the hypothesis, the statistical analysis used was the t test independent.

III. RESULT AND DISCUSSION

A. Athlete Knowledge About Eating Disorder

Eating disorder or eating disturbance was the third biggest problem frequently encountered in adolescents [16]. Eating disorder is mental disorder aims to maintain the weight loss that can result in a person's health and psychosocial.

Bredbenner classified eating disorder in three: Anorexia Nervosa, Bulimia Nervosa, and eating disorders not otherwise specified [17]. In athlete eating disorder occur when they want to have specific weight and body shape.

Knowledge about the dangers of eating disorders in athlete need to be owned by the athlete, due to the impact of eating disorder that can be harmful to health and can reduce the performance of the athlete.

Result showed that athlete knowledge about eating disorder before and after treatment in two groups (treatment and control) shown in table 1.

Table 1. Athlete knowledge about eating disorder

Category of knowledge	Treatment Group (n=23)		Control Group (n=23)	
	Pre test	Post Test	Pretest	Post test
	%	%	%	%
Good	8.7	27.4	10.0	5.0
Fair	43.5	73.9	35.0	10.0
Poor	47.8	8.7	60.0	80.0
Percent age	100	100	100	100

Result from pretest showed that in treatment group Less than half athlete (47.8%) have poor and fair knowledge (43.5%) about eating disorder. Only 8.7% who have good knowledge about eating disorder. In control group, more than a half (60%) were categorized in poor, less than half (35%) have Fair knowledge and only 10% athlete in control group categorized in good knowledge about eating disorder. After the intervention done, we conducted the posttest among treatment and control group. The result showed that in treatment group there was significant increase in knowledge. Athlete categorized in good knowledge was 27.4%, fair knowledge was 73.9% and there were decreasing in poor category, only 8.7%. This result was inversed to control group, as we can see in table 1. Increased knowledge about the eating disorder maybe caused by researchers used a model of the I CARE to deliver the material. I CARE learning model could improve student learning outcomes in ICT subjects [18].

B. Athlete Knowledge about Nutrition

Nutrition knowledge is the ability of someone to remain the nutrient in food also the function of nutrient for the body. Result showed that athlete knowledge about nutrition before and after treatment in two group (treatment and control) shown in table 2.

Result from pretest showed that in treatment group, most of athlete (82.6%) have poor nutrition knowledge, 13,0% have fair nutrition knowledge and only 4,4% athlete with a good nutrition knowledge. Result for pretest in control group was similar to the treatment group. Most of athlete categorized in poor knowledge (75%), only 5% athlete in control group who have good nutrition knowledge. The percentage athlete

categorized in good and fair nutrition knowledge from treatment group was increased after the intervention. There were 34.8% categorized in good nutrition knowledge and more than a half (65.2%) were categorized in fair. In control group the result from posttest was increased, but the number of percentage was lower than treatment group. Increased knowledge of nutrition of athlete was expected to improve their eating habits. There is a positive relationship between nutrition knowledge and eating habits. The higher knowledge of nutritional, the better the eating habits of the athlete [19].

Table 2. Athlete knowledge about Nutrition

Category of knowledge	Treatment Group (n=23)		Control Group (n=23)	
	Pre test	Post Test	Pre test	Post Test
	%	%	%	%
Good	4.4	34.8	5.0	5.0
Fair	13.0	65.2	20.0	50.0
Poor	82.6	0	75.0	45.0
Percentage	100	100	100	100

C. Athlete Knowledge about Effective Exercise

Exercise is a physical activity that is carried out systematically improved progressively and with a specific purpose. An athlete training to improve performance, fitness and recreation. Every athlete need exercise for maintaining their stamina and endurance.

Table 3. Knowledge about effective exercise

Category of knowledge	Treatment Group (n=23)		Control Group (n=23)	
	Pre test	Post Test	Pre test	Post Test
	%	%	%	%
Good	8.7	43.5	5.0	5.0
Fair	13.0	47.8	25.0	30.0
Poor	78.3	8.7	70.0	65.0
Percentage	100	100	100	100

Result from pretest showed that athlete knowledge about effective exercise both group were in poor category. After the intervention conducted treatment group were increase in knowledge. 43.5% athlete categorized in good and 47.8% were categorized in fair knowledge. Inversely in control group, there's no increasing in knowledge in that group.

Athlete must understand about principle of exercise. The most important of exercise is overload. The concept of overload is that sufficiently high stress must be placed in their exercise [20].

D. Athlete Knowledge about Ergogenic Aid

Ergogenic aid is a physical, mechanical, nutritional, psychological, or pharmacological substance or treatment that either directly improves physiological variables associated with exercise performance or removes subjective restraints which may limit physiological capacity [21]. The result showed that most of athlete had a poor knowledge about ergogenic aid, shown in table 4

Table 4. Athlete Knowledge about Ergogenic Aid

Category of knowledge	Treatment Group (n=23)		Control Group (n=23)	
	Pre test	Post Test	Pre test	Post Test
	%	%	%	%
Good	4.4	26.1	0.0	0.0
Fair	13.0	69.6	35.0	50.0
Poor	82.6	4.3	65.0	50.0
Percentage	100	100	100	100

As shown in table 4, athlete knowledge about ergogenic aid in two groups was similar. More than a half athlete (82.6% and 65%) has a poor knowledge and only 4.4% in treatment group who have a good knowledge about ergogenic aid. No athlete in control group had a good knowledge about ergogenic aid. Every athlete must have knowledge about ergogenic aid, because some of ergogenic aid will harmful for the body if it's consumed without prescription. Some of ergogenic aid like steroid was not permitted to use or illegal, because Echocardiographic results showed that bodybuilders who use steroids have smaller left ventricular dimension with thicker walls, impaired diastolic function, as well as higher peak systolic strain rate in steroid-using bodybuilders as compared to the other two groups [22].

E. Athlete knowledge about preventing depression

Depression is a common mental disorder, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration [23]. Depression in athlete could occur when they were stress, have personal problem, exercise stress and social aspects, team cohesion associated supporting systems like managers and coaches [24]. The knowledge preventing depression in athlete was shown in table 5.

Table 5. Athlete Knowledge about Preventing Depression

Category of knowledge	Treatment Group (n=23)		Control Group (n=23)	
	Pre test	Post Test	Pre test	Post Test
	%	%	%	%
Good	4.4	13.0	5.0	5.0
Fair	47.8	82.6	10.0	35.0
Poor	47.8	4.4	85.0	60.0
Percentage	100	100	100	100

The pretest result showed that in treatment group less than a half athlete (47.8%) categorized in poor knowledge and (47.8%) in fair knowledge and only 4,4% with a good knowledge. In control group most of athlete have poor knowledge about preventing depression (85%). Posttest showed that in treatment group athlete knowledge were increased. Athlete depressions occur due to stress, whether from inside or pressure from the coach. The athlete should have knowledge about how to prevent depression.

F. The effectivity of nutrition education ATHENA (Athlete Targeting Healthy Exercise and Nutrition Alternatives) in increasing athlete knowledge

Nutrition education ATHENA (Athlete Targeting Healthy Exercise and Nutrition Alternatives) which has been implemented to the athlete during the 7 meetings were proven to increase knowledge of the athlete about eating disorders, nutrition knowledge, practice effective, the use of ergogenic aid and overcoming depression. Improved nutrition knowledge between treatment and control group was calculate using the gain test and categorized into three : (1) high : ≥ 0.7 ; (2) middle : 0.7 to 0.3 ; (3) Low : < 0.3 .

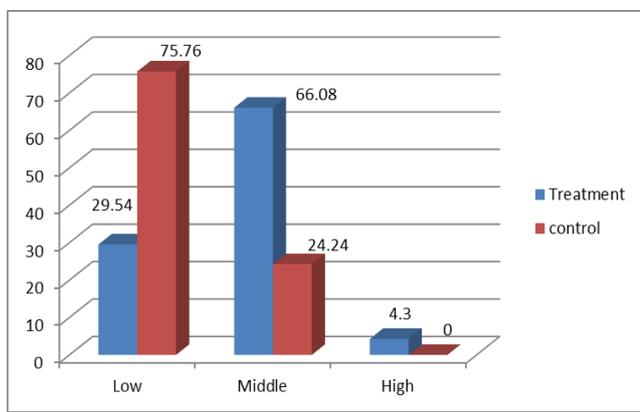


Fig 1. Comparison of Knowledge Enhancement between Treatment group and Control group

Gain test showed that in treatment group, athlete with gain in low category were 29.54%, in middle category were 66,08 % and only 4,3% athlete in high gain category. While in the control group increased in low category were 75.76%, middle gain category 24.24% and no athlete categorized in high gain. Gain in treatment group was better compare with control group, this result indicate that nutrition education ATHENA could increase athlete knowledge. conducted nutrition education for athlete could increase athlete’s knowledge about nutrition [11].

Independent T Test was conducted to see if there is a difference between the treatment group and the control group. Result showed that there were differences in gain knowledge among treatment group and control group p value < 0.003 . This result indicated that nutrition education ATHENA could

increase athlete’s knowledge. First time, ATHENA program was introduced in America. This program was developed to reduced drugs abuse among athlete in high school. ATHENA program was success in reducing drug abused among athlete in high school [13].

IV. CONCLUSION

Most of athlete had poor knowledge about eating disorder, nutrition knowledge, effective exercise, ergogenic aid, preventing depression among athlete before the intervention was conducted. ATHENA program was nutrition education program aimed to increasing athlete knowledge. It was conducted in seven week. Each meeting was 1 x 60 minutes. The program held after the athlete done the exercise. The nutrition education intervention ATHENA effectively has been increasing athlete knowledge. Coverage material consists of knowledge about eating disorders, nutrition knowledge, effective exercise, ergogenic aid, preventing depression among athlete.

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