

DEVELOPMENT PROCESS OF A FOOD AND NUTRITION EDUCATION PROGRAM FOR ADOLESCENT BRAZILIAN VOLLEYBALL PLAYERS

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ABSTRACT

Young athletes are vulnerable regarding the adoption of inadequate nutrition aiming to achieve weight/body composition and performance goals. The aim of this study is to describe the process of development of a Food and Nutrition Program for female adolescent Brazilian volleyball athletes. The team comprises 14 girls (17.3±1.0 years old; training 16 hours/week). Quantitative and qualitative data were collected to bring subsidies for the development of a customized program. Athletes answered questions on nutritional knowledge and beliefs, body perception and intention of changing eating behavior. Knowledge score was of 57% correct answers. Athletes showed lack of knowledge on nutritional composition and food groups. As beliefs, protein was overvalued and hydration concepts misunderstood. Body distortion was observed in 29% of the sample. Regarding the intention of behavior change, athletes were classified in the "action" (46%) stage. A discussion group was held to investigate athletes' perception and feelings towards food and pressure for results, lack of time to prepare meals and doubts about what to eat to improve performance were the main issues. Based on these results and adopting a problematization methodology (Maguerez Arch) 6 meetings were planned in which ludic and participatory activities were chosen to stimulate participation. Topics comprise: balanced eating, health and performance, hydration strategies, body perception and food intake, culinary workshops to stimulate vegetables and fruit intakes and about portion size. The program will be evaluated through the application of the same questionnaires used for the diagnosis and a discussion group. The complexity of issues related to food selection requires interdisciplinary actions and comprehensive approaches.

Key words: Food and nutrition education, athletes, food behavior

INTRODUCTION

Nutrition is one of the main factors which affect athletic performance and athletes' health. Notwithstanding, the constant quest for a competitive advantage may lead athletes to adopt unbalanced diets¹.

Food selection is a complex process influenced by biological, economic, and sociocultural and psychological factors^{2,3,4}. Regarding athletes, body composition/image, performance results' expectation, lack of knowledge and presence of beliefs are important issues that should be taken into consideration¹.

Food and Nutrition Education (FNE) is an important tool to help athletes achieve autonomy in their food selection. To be successful, a detailed evaluation of the determinants of food behavior has to be conducted so as to understand athletes' eating practices². Therefore, the objective of this study is to describe the diagnostic evaluation and developmental process of a Food and Nutrition Program for female adolescent Brazilian volleyball athletes.

METHODS

The female volleyball team of Santos/Brazil was invited to participate in a FNE program with 6 monthly 1.5-hour encounters. The study was approved by the Ethics Committee of the Federal University of São Paulo under #220.448/2013.

Quantitative and qualitative data were collected to support the development of a customized FNE program. Athletes answered questions regarding: a) demographic characteristics: age, schooling, socioeconomic status⁵; b) nutritional knowledge on concepts of food composition and groups (multiple choice questions), plus 18 statements about sports nutrition, based on beliefs found in the literature (5-point Likert scale). Every correct answer corresponded to one point. The possible knowledge score ranged from 0 to 53; c) Body distortion was screened through the Body Shape Questionnaire (BSQ), d) Body dissatisfaction was evaluated using a scale of silhouette figures⁶, representing from thinness to obesity. Athletes selected the silhouette that best represented their "actual silhouette" (AS) and their "desired silhouette" (DS). The difference between AS and DS indicated the level of dissatisfaction (zero indicating satisfaction with body image, values lower than zero indicating the desire to have a larger body and values higher than zero, the desire to have a thinner body). The greater the difference, the greater the dissatisfaction; d) The stage of behavior in relation to the adoption of a healthy diet was identified through the transtheoretical model⁷.

To complement the educational diagnosis, a discussion group was held to investigate athletes' perception and feelings towards food. Guided by pre-defined questions, athletes exposed their food preferences, barriers to healthy eating and interests about nutrition. All speeches were registered for further analysis through the Discourse of the Collective Subject method⁸, in which key-expressions corresponding to central ideas were identified in each speech, and from them, a synthesis discourse was written in the first-person singular, representing the group's idea.

For the development of the FNE program the authors adopted the theoretical framework of Freire's dialogical concepts⁹ and Marguerez' Arch method¹⁰, which proposes 5 stages: a) identification of the problem based on the reality observed; b) identification of problems' key-points; c) analysis of the problem based on knowledge; d) development of a solution hypothesis based on the reality context, and e) to put into practice what is more applicable to reality. All stages involved undergraduates and teachers of the Psychology and Nutrition courses.

RESULTS

The team comprises 14 girls 17.3±1.0 years old, training 16 hours/week. Most (71%) completed middle school, and 50% belong to socioeconomic class B. Knowledge score was of 57±9.03% correct answers. Athletes showed lack of knowledge on nutritional composition and food groups. Regarding nutrition beliefs, 86% overvalued protein, 79% misunderstood hydration concepts, and 64% believe fat intake should be extremely low. Body distortion was observed in 29% of the sample and 79% showed body dissatisfaction (figure 1).

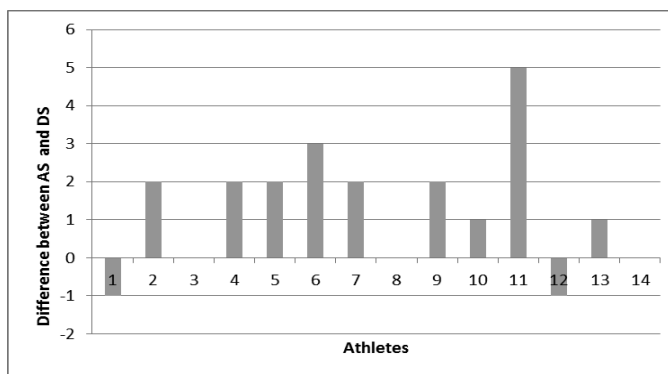


Figure 1

Body image dissatisfaction expressed as the difference between Actual Silhouette (AS) and Desired Silhouette (DS). Values=0: satisfaction, values<0: desire for a larger body, values>0: desire for a thinner body

With regard to the intention of behavior change, most athletes were classified in the “action” (46%) stage (figure 2).

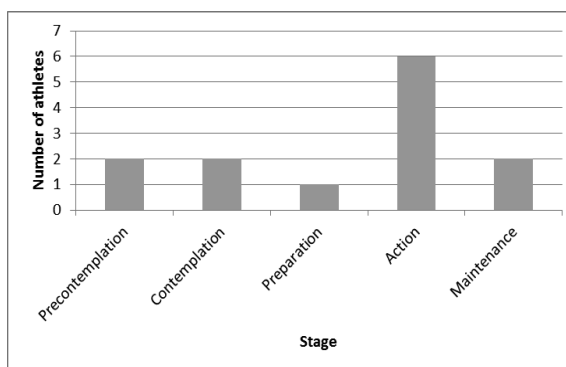


Figure 2

Distribution of athletes according to the stage of intention of behavior change

The pre-defined questions, central ideas and discourses’ synthesis extracted from the speeches of the athletes are summarized on table 1. The two initial stages of the Margueres Arch were achieved by this analysis.

Table 1 Questions, central ideas and discourse synthesis

Question	Central ideas	Discourse synthesis
I get sad when...	Fail athletic practice	<i>“I get sad when something goes wrong. I don’t know what to do next, but isolate myself and cry. Sometimes I imagine myself having a good performance, especially before a competition. This is good because I feel secure and also helps because I draw goals”</i>
	When fight with someone she likes	<i>“I get very sad when I hurt someone or I get hurt. When it happens I talk to the person or I talk to my mother or my friends. That helps a lot, but it is important to know whom to share with”</i>
	When eats sweets	<i>“I eat more sweets when I’m sad. And afterwards I feel guilty”</i>
I get happy when...	I’m successful in my athletic practice.	<i>“I get very happy when I have a good training session and I’m praised because of it”.</i>
	When I’m happy I eat to celebrate.	<i>“When we are happy we eat to celebrate. Usually it is a sweet, but we also enjoy salty foods too”</i>
I want to know...	How to substitute foods	<i>Dinner (rice,beans, meat, etc) is very important. But, can we exchange for a sandwich?”</i>
Difficulties	Lack of time	<i>I have little time to have lunch. So, I eat fast and then I compensate my hunger at dinner time”.</i>

Based on the results obtained from the questionnaires and the discussion group, the FNE program planning followed the stages summarized in figure 3.

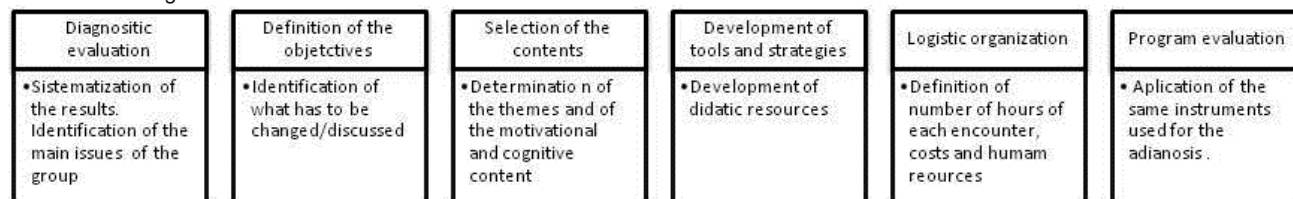


Figure 3

Stages of development of a FNE program for athletes

The stages shown on figure 3 were applied to each of the 6 encounters. The outline of the activities is depicted in figure 4.

Encounter	Educational objectives	Strategies
1°	To understand the concept of healthy diet	Exposition about the main aspects about a healthy diet . Human “table” game with questions on balance between food groups and substitution
2°	To be able to make healthy choices aiming performance	Using food images, athletes will plan meals and hydration for the competitive period (pre, during and recovery)
3°	To be able to cope with pressure for results	Group discussion based on stressful sports situations. Role playing in which each athlete will represent everyday characters: coach, winning athletes, frustrated athlete.
4°	To understand the importance of fruits and vegetables To be sensitized to eat this food group everyday	Explanation of the nutritional content using real fruits and vegetables. Healthy recipe tasting. Game “Antioxidant - Capture the Flag” with questions to fix the concept of oxidative stress and antioxidant food sources
5°	To be able to substitute food groups maintaining energy equivalence	Culinary workshop: preparation of 3 balanced energy-equivalent meals to address portion size, energy content and food substitution - dinner
6°	To understand how body image is built. To be able to make healthy food choices aiming a healthy body	Group discussion about body image, body weight and fat, performance, and healthy food choices

Figure 4

Outline of FNE activities according to objectives and strategies

DISCUSSION

Athletes presented lack of knowledge regarding food composition and food groups, as well as the presence of beliefs. Rosebloom et al¹¹ also observed that athletes believe that proteins are their main energy source. A Brazilian study evidenced that female volleyball players had an increased daily protein intake¹². To acquire knowledge about nutrition is the first step in a nutrition education process. Heaney et al¹³ observed that out of nine studies which investigated the relationship between knowledge and food intake, five found a positive association.

Body image is formed by a perceptive and attitudinal (subjective) determinant, described by Kakeshita and Almeida¹⁴ as “the satisfaction one has towards his/her body size or specific parts of his/her body”, and is an important component for the construction of the identity. The high prevalence of body image dissatisfaction evidenced in this study was expected. Body image is strongly affected by the media, as well as by the pressure encountered in sports environment. Studies with athletes show that food choices may be based on the concern towards physical appearance and weight control, instead of performance goals^{15,16}. However, the relationship between food, physical activity and body image construction can be positive, for instance, when it leads to a reconstruction of a healthier food practice¹⁷.

Identifying the stage of intention of behavior change helps to determine the best strategy to be adopted in order to stimulate further progression through behavior change process⁷. Most athletes are in the “action” stage, characterized by behavior changes adopted for less than 6 months, symbolizing conscientiousness and the recent compromise to change. The evaluation of behavior change regarding nutrition is very complex, as the adoption of some changes (i.e. restriction of a certain food) does not guarantee other changes (i.e. substitution, increase, inclusion etc)¹⁸.

The discussion group is a method that predisposes the interaction and exposition of opinions, attitudes and behaviors, allowing the investigators to analyze their meaning¹⁹. The discussion group brought important information for the development of the FNE program, especially regarding psychological issues, for instance, the pressure for results. Fontes and Brandão²⁰ state that situations of expectation and pressure for results involving family and coaches produce a negative tension and athletes have to learn how to cope with it in order to avoid extreme frustration. Furthermore, they may deal with a self-imposed pressure in an attempt to anticipate possible external expectations.

Studies show that athletes are interested in receiving food and nutrition information^{15,16} and an increase in knowledge can be observed as a result from FNE programs, as well as auto-efficacy and adoption of positive nutrition behaviors^{13,21,22}. However, FNE programs have to reach beyond the goal of information transmission and focus on attitudes and development of food behavior autonomy, respecting the unique experiences of each individual, which differ according to their social group, cultural context and individual differentiation²³. It should take into consideration personal aspects, such as beliefs, perceptions, preferences and aversions².

Planning a well structured FNE program allows better results, especially regarding the evaluation throughout and at the end of the process²⁴.

Considering the age of the group and the importance of selecting participatory approaches, the strategies suggested for the encounters are based on ludic activities, which are well accepted by adolescents, while facilitating their personal, social, cultural, and health development²⁵. The FNE is being implemented and the results of the evaluation of its impact will be published in the future.

CONCLUSION

The diagnostic evaluation provided subsidies on knowledge, perceptions, intentions, and context to enable the development of a customized FNE program aiming healthy eating and performance. The understanding that all factors involved in food selection are dynamically integrated alerts to the fact that FNE actions should not aim exclusively at the transmission of information, but should focus on perceptions, and cultural and social issues as well. Planning should focus on issues diagnosed and strategies should be participatory and motivational.

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