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Food Servings Ingested Before And After An Intervention Program In A University Setting

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ABSTRACT:

PURPOSE: To compare the food servings ingested by food groups after a 12-week intervention program to promote physical activity in a university setting.

METHODS: 66 (32 men, 34 women) subjects belonging to the university community (teachers, students, administrative staff) of three different University Centers of the University of Guadalajara were evaluated on their food habits. They were asked about their daily food intake employing a food frequency questionnaire by standardized staff during the interview process. Each subject described how many days per week he/she usually ate each food and the usual amount they consumed on those days. A daily average of food group servings was calculated. Servings' size were determined according to Mexican System for Equivalent Foods. The sample was divided into three groups: Device group (D, participants wore an accelerometer), Device plus counseling group (DC, participants wore an accelerometer and received a series of tips by a website to promote the physical activity and to change health-related behaviors), and Control group (CO, participants received no intervention). Comparisons were considered significant at a p-value <0.05.

RESULTS: Subjects' age, body weight, and stature were: 24 ± 7 and 21 ± 7 years, 69.9 ± 12.9 and 57.9 ± 13.0 kg; and 172.1 ± 8.4 and 160.1 ± 8.4 cm, for men and women, respectively. Cereals was the food group most consumed and Legumes the less one for all groups. Considering the average, the intake of Fats increased for all groups. However, Seeds group decreased significantly in the D and CO groups only. No other significant difference was observed.

CONCLUSIONS: The addition of non-contact counseling was associated with no change in Seeds group in comparison with the other groups. Maybe this kind of intervention might not be effective to modify food intake in this population.

INTRODUCTION

The quest to promote and maintain healthy behaviors is a constant concern. For example, the university population has been subject to study by multiple investigators because it is likely that the adopted behaviors at this stage may remain for several years (1). Many university students, including university athletes, engage in poor food behaviors that put them at nutritional risk and may later lead to obesity (2) (3). Previous studies in this population indicated that nutritional education interventions improved both nutritional knowledge and the number of positive dietary changes; however, these interventions failed to address the finite amount of time available to student-athletes considering their busy schedules (2). On the other hand, in recent years, there has been increasing interest in developing and evaluating *web-based interventions* for physical activity. These offer several advantages over face-to-face interventions and those based on printed materials and telephone contact; including the potential to reach a large number of people at a relatively low cost, the ability to provide 24-hour access to intervention materials, and the capacity to provide immediate and tailored feedback, encouraging them to change (1) (4). Thus, the purpose of this study was to compare the food servings ingested by food groups after a 12-week intervention program to promote physical activity and adequate nutrition in a university setting.

METHODS

Subjects

We evaluated 66 (32 men, 34 women) subjects belonging to the university community (teachers, students, and administrative staff) of three different University Centers of the University of Guadalajara, México (Health Sciences: 23, Exact Sciences and Engineering: 21, and Economic-Administrative Sciences: 22). Subjects were divided into three groups: Device group (D, participants wore an accelerometer [FITBIT Flex 2]), Device plus Counseling group (DC, participants wore an accelerometer [FITBIT Flex 2] and received a series of tips by a website to promote the physical activity and to change health-related behaviors), and Control group (CO, participants received no intervention).

Anthropometry and body composition

Basic anthropometric measurements (height [SECA 213], weight and body fat [both TANITA TBF 410]) were performed following a standardized protocol (5).

Food servings consumption

A food frequency questionnaire for each subject was administered. Each questionnaire included a total of 75 local foods, divided in 9 food groups: Animal Source Foods, Dairy, Legumes, Cereals, Vegetables, Seeds, Fats, Fruits, and Sugars. The subject was asked how many days per week consumed each food from each food group, and how many food servings he/she ingested each day. The questionnaire was applied by standardized nutritionists in the interview process. Food servings´ size were determined according to the Mexican Equivalent Foods System (6). The intake of daily servings by food group for each subject was calculated.

Statistics

The sample was separated by groups and we calculated the median, minimum, and maximum of ingested servings by food group before and after the intervention program. Data are expressed as mean ± standard deviation unless otherwise stated.

RESULTS

The subjects general description is shown in Table 1. According to food groups, Cereals was the most consumed; on the other hand, Legumes was the less one for all groups. Based on the average, the intake of Fats increased for all groups. However, Seeds group decreased significantly in the D (2.0 vs 1.0) and CO (1.0 vs 0.5) groups before and after intervention program only, respectively. No other significant difference was observed (Table 2).

Table 1. Participants general description (n=66)

Variable	Total*	Device (n=25)	Device plus Counseling (n=25)	Control (n=16)
Body Weight (kg) (n= 64)	64.0 ± 13.0	63.5 ± 13.0	64.0 ± 13.0	63.0 ± 13.0
Height (cm) (n=63)	166.0 ± 8.0	166.0 ± 8.3	166.0 ± 8.0	166.0 ± 8.0
BMI (kg/m^2) (n= 63)	23.0 ± 4.0	23.0 ± 3.7	23.0 ± 4.0	23.0 ± 4.0
Age (Years)	22 ± 7	22 ± 7	22 ± 7	22 ± 7
Body fat percentage (n=56)	20.0 ± 9.0	20.1 ± 8.8	20.0 ± 9.0	20.0 ± 9.0

*Data expressed as mean ± standard deviation.

BMI: Body Mass Index.

Table 2. Number of food servings ingested by Food Group in the studied groups (n=66)

	Device (n = 25)		Device plus Counseling (n = 25)		Control (n = 16)	
Food Groups	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
ASF	6.0 ±3.1*	5.4 ±2.7	6.0 ±3.0	5.0 (2.0 - 14.0)	7.7 ±3.9	7.1 ±3.0
Dairy	2.0 (0.0-7.0)**	3.0 (0.0-11.0)	2.6 ±1.6	2.0 (0.0-4.0)	3.6 ±1.5	3.4 ±1.9
Legumes	1.0 (0.0-6.0)	1.0 (0.0-6.0)	0.0 (0.0-1.0)	0.0 (0.0-3.0)	1.0 (0.0-2.0)	1.0 (0.0-2.0)
Cereals	6.0 (3.0-18.0)	8.2 ±4.0	7.8 ±3.8	7.0 (3.0-24.0)	10.3 ±5.9	8.0 (1.0-28.0)
Vegetables	2.0 (0.0-5.0)	2.0 (0.0-8.0)	2.0 (1.0-6.0)	2.0 (0.0-7.0)	1.5 (0.0-12.0)	2.0 (1.0-6.0)
Seeds	2.0 (0.0-11.0)	1.0 (0.0-7.0)^a	0.0 (0.0-11.0)	0.0 (0.0-3.0)	1.0 (0.0-9.0)	0.5 (0.0-3.0)^a
Fats	3.0 (0.0-16.0)	4.0 (2.0-16.0)^a	4.0 (0.0-17.0)	5.0 (1.0-15.0)^a	3.5 (0.0-15.0)	5.0 (2.0-22.0)^a
Fruits	3.6 ±2.0	3.0 (1.0-10.0)	3.0 (1.0-11.0)	3.0 (1.0-11.0)	2.5 (0.0-13.0)	4.2 ± 2.6
Sugars	2.7 (0.0-12.0)	2.0 (0.0-8.0)	2.0 (0.0-10.0)	1.0 (0.0-5.0)	2.0 (0.0-8.0)	2.0 (0.0-7.0)

ASF: Animal Source Foods. *Mean ± standard deviation. **Median (min-max). ^{a}p < 0.05 pre vs post.

CONCLUSIONS

We observed that this intervention program did not affect the number of servings ingested in most of the food groups, except in Fats (increased in all groups) and Seeds (decreased significantly in the group Device and Control only).

The addition of non-contact counseling was associated with no change in certain food groups (Seeds) in comparison with the others. Maybe this kind of intervention might not be effective to modify food intake in this population.

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