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Research Article

PROMOTION OF HEALTHY LIFESTYLES IN HIGH SCHOOL STUDENTS

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Although adolescents are considered to be one of the healthiest population groups, it is also identified as vulnerable because they present risky behaviors and inadequate lifestyles that lead to serious repercussions in the future. The objective of the study was to evaluate the effect of an educational intervention on eating habits and healthy lifestyles in first semester students of the Bicentennial High School of the Autonomous University of Querétaro, enrolled in the period 2017-1, aged between 14 and 17 years. Methodology It was a quasi-experimental study of longitudinal descriptive scope. It was based on the methodology for Health Promotion established by PAHO in which various moments are considered: diagnosis, planning, execution, and evaluation. Two groups were formed (intervention and control group). Methodology It was a quasi-experimental study of longitudinal descriptive scope. It was based on the methodology for Health Promotion established by PAHO in which various moments are considered: diagnosis, planning, execution, and evaluation. Two groups were formed (intervention and control group). A pre-test was carried out on both groups, where the BMI was calculated and a battery of instruments was applied to measure Risk Eating and Health-Promoting Lifestyle Behaviors. Based on the results obtained, an educational intervention was designed. The program was carried out only for the intervention group. At the end, a post-test was performed where the measurements and the instrument battery were applied again. Unhealthy behaviors decreased significantly in the intervention group in the dimensions of exercise and physical activity ($p < 0.001$), leisure time ($p < 0.001$), diet ($p < 0.001$), interpersonal skills ($p = < 0.001$), coping ($p = 0.005$) and perceived emotional state ($p = 0.003$). Regarding the control group, there were significant changes in the means of risky eating behaviors ($p < 0.001$) and in the leisure time dimension ($p = < 0.001$), however, the changes were negative in both cases. When making the comparison between groups, a significant change was obtained in the variables of risky eating behaviors ($p = < 0.001$), exercise and physical activity ($p = < 0.001$), leisure time ($p < 0.001$), diet ($p < 0.001$), interpersonal skills ($p = < 0.001$) and coping ($p < 0.001$). It was concluded that educational interventions are an effective tool to achieve a modification of unhealthy habits in adolescents, thereby achieving health promotion, improving their quality of life in the long term.

INTRODUCTION

Health promotion is a process that allows people to increase control over their quality of life; This is based on the modification of the causes and conditions that affect or favor their state, through the management of personal risks, the development of competencies and the creation of healthy environments.

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The strategy to achieve this promotion is health education, which is considered as one of the fundamental pillars in public health (PAHO / WHO, 2016).

Health education encompasses a broad concept within prevention, promoting the adoption of healthy behaviors to create healthy lifestyles. Lifestyle is defined as a behavior that an individual presents in a consistency over time (Salazar *et al*, 2010) in which healthy or unhealthy habits can be presented.

To achieve healthy habits and modify unhealthy habits, the Pan American Health Organization recommends the Bandura Cognitive-Behavioral Pedagogical Model. There are several dimensions that make up the lifestyle, within which it is important to form healthy habits, one of them is nutrition (Fuertes, 2009).

Adequate eating is of vital importance since it ensures growth and development, prevents future illnesses and affects health problems such as diabetes mellitus, overweight, obesity, and chronic degenerative diseases; On the contrary, unhealthy eating is one of the main risk factors for health worldwide, with adolescents being one of the most affected groups (Ministry of Health, 2012; WHO, 2015).

The World Health Organization (WHO, 1995), defines adolescence as the stage between 11 and 19 years. In Mexico, although adolescents are considered to be one of the healthiest population groups, it is also pointed out as a vulnerable group, this because they present risky behaviors and inappropriate lifestyles that lead to serious repercussions in the future (Barcelata, 2015). According to the WHO (2014), the main problems that arise during adolescence are, among others, overweight and obesity, where it has been observed that adolescents with overweight or obesity are increasing in both low and high-income countries. economic, which implies the presence of non-communicable diseases in the medium and long term.

Conditions that affect the nutritional status of adolescents (overweight, obesity, underweight, and risky eating behaviors) were associated with long-term consequences in the development of chronic-degenerative diseases, such as diabetes, high blood pressure, and accidents. vascular brain, hence they are considered one of the main challenges to be addressed from a perspective of prevention and promotion of healthy lifestyles (NOM-047-SSA2-2015).

According to the WHO (2016), *almost two thirds of premature deaths and one third of the disease burden that occurs in adults are attributed to diseases and / or behaviors that began in their youth.* Therefore, it is necessary to design and implement low-cost, high-impact interventions aimed at developing healthy eating habits and a culture of physical activation in adolescents, so that they have the opportunity to enjoy good health in the adulthood.

Adolescence and youth are considered decisive stages in the acquisition and consolidation of lifestyles, for which reason it is a priority to stimulate mature operating patterns and the development of a clearly defined personal and social identity (NOM-047-SSA2-2015).

The objective was to evaluate the effect of health promotion through an educational intervention on healthy lifestyles, aimed at a group of students of both sexes in the first semester (14 to 17 years) of the Bicentennial School of High School Graduates of the UAQ,in the period February-June 2017.

Hypothesis

A health promotion based on an educational intervention in the first semester students of the UAQ School of Bicentennial Graduates, improves healthy lifestyles.

METHODOLOGY

The type and design of the study was quasi-experimental with a longitudinal descriptive scope. The sample was obtained in a non-probabilistic way, 100% of the population was included; With a total sample of 128 students from the Bicentennial High School of the Autonomous University of Querétaro, the selection of the analysis units was carried out through convenience sampling.
The data collection was carried out within the same facilities of the educational establishment at the time established by the institution so as not to affect the academic activities of the students. To carry out the project, the Methodology for Health Promotion established by the Pan American Health Organization was taken, which considers various moments for program planning: diagnosis, planning, execution and evaluation.

Two study groups were formed. A) Intervention Group and B) Control Group. Although the methodology of quasi-experimental studies does not establish random allocation as an indispensable condition, for the purposes of the study and in order to make it more reliable, the allocation of the units of analysis for each group was carried out in a random and proportional manner.

To the members of both groups (A. Intervention; B. Control), a pre-test was performed, where the measurement of their weight and height was carried out, using a Tanita BC-568 Segmental Composition Monitor Scale and a SECA 213 portable stadiometer; BMI was subsequently calculated using OMS Anthro Plus v. 1.0.4., Classified from the Z scores according to the WHO.

These measurements were made in a clean, spacious and private space, which was previously requested from the educational establishment authorities. At all times, the physical and psychological integrity of the participant, as well as their dignity and autonomy, were preserved.

Likewise, a battery of instruments validated in the Mexican population was applied to measure the variables Risk Eating Behavior (acronym in Spanish CAR) and Health-promoting Lifestyle, (acronym in Spanish EVPS). These self-administered instruments were applied in the classroom at the times established by the academic authority and in the presence of the teacher on duty.

To measure the variable lifestyles, the lifestyle questionnaire (CEVJU-R) by the authors Salazar, *et al*. (2010), which consists of 68 questions with the option of closed answers and different forms of answer: Likert-type scale, multiple choice and single choice. The questionnaire is divided into eight dimensions of lifestyle: physical activity, leisure time, food, alcohol consumption, cigarette and illegal drugs, sleep, interpersonal skills, coping and perceived emotional state. Each dimension has a cut-off point, categorizing it into unhealthy practices and healthy practices.

To measure Risk Eating Behavior, the questionnaire carried out by Unikel, *et al*. (2004), which consists of 10 closed questions, which include questions about worry gaining

weight, binge eating, feeling of lack of control when eating and restrictive and purgative eating behaviors, with four response options: never or almost never, sometimes, frequently and very frequently. The cut-off points are taken according to the total sum of points classifying them into: no risk, moderate risk and high risk.

Based on the results obtained, it was possible to establish the dimensions in which the greatest affectation was presented, from which the educational intervention was designed with a multidisciplinary approach.

With group A, in addition to the pre-test measurements, after planning, the intervention program was developed during the period from March to June 2017, based on the characteristics of the brief intervention[1].

Once the intervention program was concluded, the battery of instruments and anthropometry were applied again to both groups, considering these measurements the post-test of the research. The impact of the intervention was measured by contrasting the significant differences found in the pre-test and post-test results.

The data were analyzed using the SPSS Statistics Version 23.0 package

To confirm that the intervention had an impact and significance in the population, a student's t test was performed evaluating the significance of the changes between pre and post test for each of the groups, in addition to an ANOVA for the comparison of the changes between the intervention group and the control group.

RESULTS AND DISCUSSION

177 adolescents participated, of which 49 participants were eliminated: five because they dropped out of the study program; 11 did not cover 100% attendance at the intervention sessions and 33 decided to abandon the study. In this way, the results presented below correspond to 128 adolescents, which corresponds to 53.5% of the study population. 58.6% (75) of the sample were women and 41.4% (53) men, with a maximum age of 17 years and a minimum of 14 years (χ=15.17; DE=0.48).

In the results of the frequency of consumption, it was observed that 72.7% of the students consume dairy products daily, being the group with the highest consumption; However, it is important to note that the second group of foods with the highest daily consumption were sugars with 70.3%, being the only group with a consumption in 100% of the participants. The consumption of vegetables is occasional in 60.9%, while junk food is a group of high consumption from 1 to 3 times a week in 69.5% of the students.

[1] The brief intervention is an alternative intervention with favorable results in clinical practice. Its purpose is the change of a specific behavior. The duration of the brief intervention should be greater than five sessions; the time should be limited and of short duration, it is45 to 60 minutes recommended.

Table 1 Frequency of food consumption

Foodgroup	Daily N=128		1 to 3 times a week N=128		Never N=128	
	fx	%	Fx	%	fx	%
Fruit	65	50.8%	61	47.7%	2	1.6%
Vegetable	48	37.5%	78	60.9%	2	1.6%
Cereals	43	33.6%	79	61.7%	6	4.7%
Milk	93	72.7%	33	25.8%	2	1.6%
Meat	45	35.2%	82	64.1%	1	0.8%
Legumes	41	32.0%	84	65.6%	3	2.3%
Sugar	90	70.3%	38	29.7%	0	0.0%
Junkfood	35	27.3%	89	69.5%	4	3.1%

According to the Food Guide for Adolescents of the Mexican Institute of Social Security (IMSS, 2014) it is recommended to include daily and in variety the groups of fruits and vegetables, cereals and tubers, legumes and foods of animal origin; these being the three main groups of a correct diet. When evaluating the consumption of these groups in our population, we can observe that most adolescents only consume them 1 to 3 times a week, this being insufficient for a correct diet. The contribution of the other food groups is necessary to have a complete diet. Another important point is the consumption of sugar; the IMSS guidelines mention that it is important to limit the consumption of sugars and fats to achieve a correct diet, which agrees with the National Academy of Medicine where it is recommended to avoid the consumption of highly processed and / or energy-dense foods as well as sugary foods and beverages; this with the purpose of preventing the presence of overweight and obesity. In the study population, we observed that both the sugars and junk foods group are frequently consumed, highlighting that sugar is the second group with the highest percentage in daily consumption and junk food the first in consumption 1 to 3 times per week. The BMI results show that 0.8% of the participants are underweight (women 1.3%; men 0.0%), 6.3% are overweight (women 9.3%; men 1.9%) and 18.8% are obese (women 17.3%; men 20.8%).

Table 2 Body Mass Index

VARIABLE	General N =128		Men N =53		Women N = 75	
	fx	%	*fx*	%	*fx*	%
Underweight	1	0.8	0	0.0	1	1.3
Normal	95	74.2	41	77.4	54	72.0
Overweight	8	6.3	1	1.9	7	9.3
Obesity	24	18.8	11	20.8	13	17.3

Minimum=15.82; Maximum=34.72; □=22.8; DE=4.24

The prevalence of overweight found in the studied population is lower than that indicated in the ENSANUT 2016 (women 22.4%; men 18.5%) and that reported by Saucedo T. et. al. in 2015 (women 22.1%; men 15.5%). On the contrary, it was found that the prevalence of obesity was higher than that reported by ENSANUT 2016 (men 15%; women 13.9%), with a difference of 5.5 percentage points in men and 3.4 in women; as well as it is higher than the prevalence indicated in the study carried out by Saucedo et. al. (men 13.8%; women 7.1%), with which a difference of 7 percentage points can be observed in men and 10.2 in women.

It was found that 19.5% of the students presented risky eating behaviors, with 14.7% moderate risk being observed in women and 9.4% high risk in men.

Table 3 Risky Eating Behaviors

VARIABLE	General N =128		Men N =53		Women N = 75	
	fx	%	*fx*	%	*fx*	%
Risk free	103	80.5	45	84.9	58	77.3
Moderaterisk	14	10.9	3	5.7	11	14.7
High risk	11	8.6	5	9.4	6	8.0

Sámano *et al*. (2012) and Mendoza *et al*. (2014) in their studies reported a prevalence of REB (CAR) of 9.4% and 12% respectively, observing a moderate and high risk in women; In both studies, a lower prevalence is observed than that found in our study population (19.5%), in addition to differing with the high-risk results, where a higher percentage was presented in men.

Regarding lifestyle, it was observed that 33.6% of the studied population presented unhealthy practices in the exercise and physical activity dimension (men 26.4%; women 38.7%) as well as in the perceived emotional state dimension (34.4%), this being higher in women (38.7%).

Table 4 Lifestyle dimensions

VARIABLE	Healthy						Unhealthy					
	General N=128		Men N =53		Women N = 75		General N=128		Men N =53		Women N = 75	
	fx	%	*fx*	%	*fx*	%	*fx*	%	*fx*	%	*fx*	%
Exercise and physicalactivity	85	66.4	39	73.6	46	61.3	43	33.6	14	26.4	29	38.7
Leisure time	104	81.3	46	86.8	58	77.3	24	18.8	7	13.2	17	22.7
Eating	122	95.3	52	98.1	70	93.3	6	4.7	1	1.9	5	6.7
Sleeping	110	85.9	46	86.8	64	85.3	18	14.1	7	13.2	11	14.7
Interpersonal skills	103	80.5	48	90.6	55	73.3	25	19.5	5	9.4	20	26.7
Coping	118	92.2	51	96.2	67	89.3	10	7.8	2	3.8	8	10.7
Perceivedemotionalstate	84	65.6	38	71.7	46	61.3	44	34.4	15	28.3	29	38.7

Similar findings reported by Saucedo et. al. (2015), where 39.3% of women were "less active" in terms of physical activity and sports. Similarly, the study carried out by Monje and Figueroa (2011) shows that 15.2% of adolescents presented unhealthy practices for *physical activity and sport.*It also coincides with the data from ENSANUT 2016, in which men were more active compared to women, with 49.3% presenting inactivity.

According to the problems found in the diagnostic results, the objective of the intervention program and the contents were determined, in which the affected areas were mainly covered, in addition to other dimensions to reinforce the training of students. In the same way, the pedagogically based didactic activities were structured under the cognitive-behavioral and sociocultural approach.

Table 5 Relevance variables of the study population

VARIABLE	SUITABLE		NOT SUITABLE	
	fx	%	fx	%
BMI	95	74.2	33	25.8
REB (CAR)	103	80.5	25	19.5
Exercise and physicalactivity	85	66.4	43	33.6
Perceivedemotionalstate	84	65.6	44	34.4

The intervention was structured from pedagogical approaches and in a multidisciplinary manner, covering three areas: psychological, where group integration and emotional control, trust and emotional ties, body perception and social demand were included; physical activity, with the themes of exercise and leisure time; and health, in which the topics of body composition, healthy eating, school orchard and dental health were addressed. With these topics and following the proposed pedagogical model, the activities for the intervention were carried out.

The intervention consisted of nine sessions, carried out once a week with a duration of 60 minutes per session. The schedule was established by the School Site Coordinator. The duration of the planning and the time of the sessions were designed specifically for the population.

At the end of the educational intervention, the change in the population means was evaluated, to look for differences between the pre and post test. The intervention group decreased unhealthy behaviors in all variables, except for the consumption of alcohol, tobacco and drugs where the final mean increased; the decrease in means was significant in the dimensions of exercise and physical activity ($p < 0.001$), leisure time ($p < 0.001$), eating ($p < 0.001$), interpersonal skills ($p < 0.001$), coping ($p = 0.005$) and perceived emotional state ($p = 0.003$) for this group. Regarding the control group, there were no significant favorable changes.

Table 6 Pre- and post-test mean changes of intervention group and control group

VARIABLE	$\bar{x}$ initial	$\bar{x}$final	Diferenceof$\bar{x}$	OF	Valueof*p* *
REB (CAR)					
Intervention	4.48	3.69	0.7910	4.194	1.270
Control	5.59	10.23	-4.6493	6.491	<0.001
Exercise and physical activity					
Intervention	6.69	5.31	1.3731		<0.001
Control	6.38	6.69	-0.3115	1.914	0.305
				2.349	
Leisure time					
Intervetion	6.34	4.85	1.4925	1.682	<0.001
Control	5.46	6.30	-0.8361	1.519	<0.001
Eating					
Intervention	12.25	10.18	2.0746	1.933	<0.001
Control	13.36	12.87	0.4918	2.885	0.188
Consumption of alcohol, tobacco and drugs					
Intervention	5.82	6.24	-0.4179		0.066
Control	6.10	6.33	-0.2295	1.827	0.362
				1.935	
Sleeping					
Intervention	5.76	5.55	0.2090	2.385	0.471
Control	5.64	5.87	-0.2295	1.802	0.324
Interpersonal skills					
Intervention	10.28	10.08	1.5672	2.231	<0.001
Control	8.72	10.61	-0.5246	3.009	0.178
Coping					
Intervention	15.63	14.40	1.2239	3.419	0.005
Control	15.80	15.85	-0.0492	3.792	0.178
Perceived emotional state					
Intervention	13.96	12.90	1.0597	2.838	0.003
Control	14.52	14.51	0.0164	3.274	0.969

* Student's T test

The changes between the intervention group and the control group were compared, obtaining a significant change in the variables REB (CAR) ($p < 0.001$), *exercise and physical activity* ($p < 0.001$), *leisure time* ($p < 0.001$), *eating*($p < 0.001$), *interpersonal skills* ($p < 0.001$) and *coping* ($p = 0.048$).

Table 7 Difference between intervention group and control group

Variable	Intrevention ($\bar{x}$)	Control ($\bar{x}$)	OF	Valueof*p**
REB (CAR)	0.7910	-4.6493	6.038	<0.001
Exercise and physicalactivity	1.3731	-0.3115	2.285	<0.001
Leisure time	1.4925	-0.8361	1.981	<0.001
Eating	2.0746	0.4918	2.550	<0.001
Consumption of alcohol, tobacco and drugs	-0.4179	-0.2295	1.883	0.574
Sleeping	0.2090	-0.2295	2.115	0.243
Interpersonal skills	1.5672	-.5246	2.822	<0.001
Coping	1.2239	-0.0492	3.644	0.048
Perceivedemotionalstate	1.0597	0.0164	3.086	0.056

*ANOVA

According to Vega and Gómez (2012), carrying out a cognitive behavioral intervention in risky eating behaviors decreases the prevalence of risky eating behaviors in adolescents and modifies their eating habits. This is presented in the results obtained in our population where REB (CAR) and the eating dimension improved significantly from the intervention with this same model.

Regarding lifestyles, the authors Vallejo and Martínez (2017) found that, from a workshop focused on lifestyles, the risk of inappropriate behaviors in the areas of eating habits, psycho-body balance and free time decreased. In the area of toxic substance use, an increase was observed in women and a decrease in men. These results coincide with what was found in the study population where the dimensions of food, perceived emotional state and leisure time improved; Similarly, it was found that the consumption of toxic substances increased mainly in the group of women.

Silva *et al*. (2014) agrees with the results derived from the intervention, where, based on a study carried out in adolescents, it was intervened in the development of healthy behaviors in eating, sexual and reproductive health, health problems and skills in adolescents, obtaining positive results.
According to a study carried out by Morales, *et al*., (2013) concluded that, from an educational intervention, social skills are more susceptible to change and improvement; however, they observed that cognitive skills require more time to improve. Likewise, in the present study it was found that a brief educational intervention carried out in adolescents can improve their lifestyle.

CONCLUSIONS

From the diagnosis it was observed that the adolescents of the Bicentennial High School of the Autonomous University of Querétaro are a population group in which there is a risk of presenting long-term diseases. This is due to the fact that they present unhealthy behaviors in different aspects of their health, mainly adolescents showed an inadequate diet for the needs of their age, adding that there is a high prevalence of overweight, which if it is not controlled, can progress to obesity, increasing its prevalence. The presence of risky eating behaviors is also added, which can trigger a disorder, affecting the health of adolescents to a greater extent. Regarding lifestyles, there are some dimensions in which adolescents tend to show unhealthy behaviors, mainly lack of exercise and physical inactivity, which could increase the risk of being overweight and obese; and the affected emotional state (feeling loneliness, sadness, anger, stress, among others) due to various factors, these being one of the main problems affecting this age group. Despite the fact that most of the population was healthy in the other dimensions, the importance of addressing the lifestyle as a whole, with all dimensions, can be evidenced from the study, since it is likely that in the course of the time they begin to show unhealthy behaviors. When conducting the final evaluation, a significant decrease in unhealthy behaviors was found in the students who formed the educational intervention group, mainly in exercise and physical activity, leisure time, eating, interpersonal skills, coping and perceived emotional state, since a decrease in the mean of these dimensions was found; whereas, the control group increased their unhealthy behaviors in most dimensions, without being significant the change.

When comparing the changes of both groups, it was found that the difference was significant in REB (CAR), exercise and physical activity, leisure time, eating, interpersonal skills and coping, since the intervention group presented a decrease in unhealthy behaviors, while the control group had a minimum decrease in the unhealthy behaviors presented, being the change of the intervention group of great importance.

With this, it is concluded that educational interventions based on a cognitive-behavioral and sociocultural model are an effective tool in the adolescent population to achieve modification of unhealthy habits.

Improving unhealthy habits helps us prevent chronic degenerative diseases in the long term, in addition to raising awareness and creating a culture of prevention in adolescents. The participation of nutritionists is key in the promotion of health and the prevention of diseases, since making a timely diagnosis, whether of malnutrition, overweight or obesity, helps to carry out an adequate treatment and with this to recover and maintain a state wellness and health; eventually improving their quality of life.

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