



Promotion of Health in Self-efficacy, to Reduce Tobacco Consumption in Young Adults

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Authors' contributions

This work was carried out in collaboration between all authors. Author AAA designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author GOV participated in to write protocol, managed the literature searches. Author NPR performed the statistical analysis and participate in to write the first draft. Author MLJJ managed the literature searches and the literature to write the first draft. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJTDH/2017/37546

Editor(s):

(1) Mustafa Ulubay, Obstetrics and Gynaecology Department, Gulhane School of Medicine, Health Sciences University, Turkey.

Reviewers:

(1) Chong Leong, Gan, Malaysia.

(2) Neema Tiwari, Era's Lucknow Medical University, India.

Complete Peer review History: <http://www.sciencedomain.org/review-history/21701>

Original Research Article

Received 20th October 2017
Accepted 28th October 2017
Published 2nd November 2017

ABSTRACT

Aim: The objective was determinate the effect of intervention on the self-efficacy and tobacco intake, to decrease smoking in young adults.

Study Design: Study interventional.

Place and Duration of the Study: Juventino Rosas, Mexican community, between September 2014 and May 2015.

Methodology: sample of 101 smoking young adults between 20 and 30 years. The experimental group had 50 participants and control group 51, and all signed the inform consent. For data collection were used the "Scale for measuring the level of efficacy for smoking cessation" and "Questionnaire for the classification of consumers of cigarette for young". The intervention was developed in 12 weekly sessions of 50 minutes each, for 3 months, aimed at increasing the self-

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efficacy through strategies of education, motivation and handling emotions.

Results: There was an association between interventional group and high self-efficacy ($P=.01$) and the OR = 2.96, IC95%=1.28 to 6.84. There was an association between consumed cigarettes and intervention group ($P=.0001$); OR=0.2, IC95% =0.08 to 0.46.

Conclusion: The interventional group improved significantly the level of self-efficacy and reduced consumption of cigarettes.

Keywords: Tobacco intake; young adults; health promotion; educative intervention; self-efficacy.

1. INTRODUCTION

The Health Promotion Model provides a basis for studying how individuals make decisions about care for their own health, within the context of nursing, also allows the exploration of complex biopsychosocial processes that motivate individuals to perform health-generating behaviors [1].

The model is based on three theories of behavior change, influenced by culture: Reasoned Action theory, Theory of Action Planned and Theory of social learning. In the latter, it is argued that self-efficacy is one of the most influential factors in human functioning; it is defined as "people's judgments about their ability to reach certain levels of performance", the confidence that an individual has in their ability to succeed in a given activity [1].

Often, unhealthy lifestyles in the young adult are manifested by conducting risk behaviors such as the use of psychoactive substances, unsafe sex, changes in lifestyle, which contributes to the population having an increase in Chronic, non-communicable diseases, associated with habits and customs, that do not produce the disease immediately, but over time, such as smoking [2].

Smoking, according to Official Mexican Standard NOM-028-SSA2-1999, is dependence or addiction to tobacco [3]. The Global Adult Smoking Survey (GASS) conducted in Mexico in 2009, reported that 15.9% (10.9 million) of adults in Mexico were smokers, 24.8% of men (8.1 million) and 7.8% (2.8 million) of women [4]. In Guanajuato state, according to the National Addiction Survey from 2008, 23.2% of the population (almost 632,000 people) are active smokers [5].

Among the personal factors that can be related to smoking in young people are self-efficacy and self-esteem; That is, a low self-efficacy predicts substance use and abuse, including tobacco as reported by authors such as Cortes et al. [6],

where they reported that the daily consumption of tobacco was 22.9% in men and 36.2% in women; The factors associated with regular tobacco use were self-efficacy and attitudes.

Martinez et al. [7], working with secondary education students from the urban and rural areas of Monterrey, Nuevo León, Mexico, in order to know if there are differences in correlation among tobacco and alcohol consumption with self-esteem and self-efficacy, reported negative and significant correlation with the amount of cigarettes consumed in a typical day (r Spearman = -0.20, $P < .001$).

Alonso-Castillo et al. [8], when testing an intervention in adolescents from secondary schools in Monterrey, Mexico, reported to decrease the consumption of tobacco and alcohol.

In Mexico City, a brief motivational intervention program for smokers that affects the pattern of cigarette consumption was evaluated together the perception of the self-efficacy of smokers; the consumption pattern was compared before, during and after the application of the intervention and the level of self-efficacy was measured. The brief motivational intervention emphasized the strengthening of self-efficacy and the relapse prevention model, which maintains the change in the user's consumption behavior during and after the intervention [9].

Palacios-Delgado [10], reported that they did not find differences in smoking between men and women; Young people who have less ability to avoid smoking will have a greater intention and conduct of smoking, and the future intention of smoking predicts their consumption.

Perceived self-efficacy in the area of health is important in the prevention of risky behaviors and in the promotion of behaviors that benefit people; Cid et al. [11], reported that perceived self-efficacy correlates positively with optimism, self-esteem, self-regulation, quality of life, positive

affects, perceived competence, resilient personality, task-centered coping, and satisfaction, which are essential elements in behavioral changes in health.

For the prevention of drug use, experience has shown that it is not enough to implement educational strategies focused on the indication of damage to health caused by the action of smoking. For this reason, it is recommended that along with the signaling of these damages it is equally important to develop in people the capacity to resist negative peer pressure and publicity, promoting self-control, self-esteem, self-efficacy and self-care, through motivation and management strategies of emotions [12].

The objective of the study was to determine the effect of intervention for health promotion on the level of self-efficacy of young adult tobacco users.

2. MATERIALS AND METHODS

2.1 Study Design

It was a quantitative, interventional, randomized, longitudinal, prospective.

2.2 Place and Universe

It was a community study in Juventino Rosas, Guanajuato, Mexico. As there was no sampling scheme for the adult population between 20 and 30 years of age, advertisements were distributed in educational, sports facilities, religious institutions, public parks inviting to young adults to participate in the study. All who came and agreed to participate were randomized to be in the experimental group or control group.

2.3 Selection of Subjects

2.3.1 Inclusion criteria

Young adults with age between 20-30 years, both genders, who accepted to participate signing the informed consent and smoke at least one cigarette at day.

2.3.2 Exclusion criteria

Those with verbal, hearing, and motor communication problems that were not present at the time of data collection and those who were in treatment for the reduction of tobacco consumption were not included.

2.4 Variables

2.4.1 Sociodemographics

It was measured age, gender, civil status, residence, and socioeconomic level.

2.4.2 Independent variable

It was the intervention program at experimental group. At control group, the intervention was applied, once the study was concluded.

2.4.3 Dependent variables

Self-efficacy. It is a dichotomous variable; It is the desire to quit smoking; It is measured with the responses of the self-efficacy scale, with the measurement scale from 0 to 15 points is low self-efficacy and from 16 to 30 high efficacy; It is summarized with frequencies and percentages.

Tobacco consumption. It is a dichotomous variable; It is the level of cigarette consumption; It is measured with the responses to the questionnaire and is measured as a mild consumer with 1 to 17 points and severe with 18 to 50 points; It is summarized with frequencies and percentages.

2.5 Instruments

Self-efficacy level measurement scale, with reliability of 0.95 of Crombach's alpha, which takes into account three dimensions cognitive, motivational and affective. It consists of 10 items, which evaluates with a maximum score of 30 points, for its measurement uses the following indicators: 0 to 15 points low self-efficacy and from 16 to 30 points high self-efficacy [11,13].

Questionnaire for the classification of cigarette consumers (C4) for young people with Crombach alpha of 0.90, which consists of 15 items that are directed to the frequency, amount of cigarettes consumed and willingness to abandon the habit with a maximum of 50 points [14]. They are divided as follows: mild to moderate smoker or low consumption: consumes less than 15 cigarettes per day and obtained in the questionnaire from 1 to 17 points. Severe or high-consumption smoker: smokes more than 16 cigarettes per day and scored 18-50 points on the questionnaire.

2.6 Procedures

All participants received information about the study and were asked to sign informed consent. Three instruments were used to collect the data: the questionnaire for describing sociodemographic data, the self-efficacy scale for smoking cessation, and the questionnaire for the classification of cigarette users. The intervention was applied for 3 months and, subsequently, the questionnaires were applied for the second time.

2.7 Intervention

The experimental group was given a health promotion program to improve self-efficacy, which was carried out for three months in 12 sessions, one session per week with a duration of 50 minutes each. These sessions included the following topics: smoking definition, epidemiological data on morbidity, various self-monitoring techniques (self-monitoring and self-regulation, self-reinforcement, distraction training techniques in breathing and relaxation, assertive techniques and self-instruction, solution training from problems). Pleasant teaching strategies were used, with which prior knowledge was activated, which helped a truly meaningful learning and thus strengthened cognitive-behavioral change.

It is important to mention that during the development of the program the following strategies were carried out to increase the self-efficacy: to inform of the advantages of not smoking; Remember repeatedly the young person's personal achievements; Show relevant non-smokers and ex-smokers; Remind the young person the people around him who have managed to quit; Persuade the young man that he is able to quit; Recommend measures that improve their fitness and diet; Teach to identify and face external pressures that incite you to smoke.

2.8 Sample Size

Assuming that in the experimental group 75% have high self-efficacy and 40% in the control group, the minimum sample size is 36 in each group, with 95% accuracy and 80% power (EpiInfo 7, 2013), CDC, Atlanta, GA, USA).

2.9 Statistical Analysis

Descriptive statistics were used for sociodemographic variables. To test hypotheses,

Z for two independent proportions was performed, and to identify the effect of the intervention on smoking, we used Odds Ratio (OR) and 95% confidence intervals. To prove statistical significance of the results the value of P was set at .05. Statistical analysis was performed on STATA 13.0 © (Stata Corp. College Station, TX, USA).

3. RESULTS AND DISCUSSION

The groups were composed of 50 subjects in the experimental group and 51 participants in the control group, whose categorical sociodemographic characteristics are shown in Table 1. In the experimental group, men predominated (88%), single (96%), students (98%) of catholic religion (62%), urban residence (86%), high socioeconomic status (76%). In the control group, men (70.6%), singles (98%), students (90.2%), catholic (76.5%), urban residents (86.3%) and high socioeconomic status (80.4%), and with family smokers (84.3%).

Comparing the distribution of the categorical sociodemographic variables, no statistically significant differences were found between the experimental and control groups, except for gender ($P = .03$). In cases where the Chi square test could not be calculated because some cell had 0, Z was used for two independent proportions.

An important aspect is the sociodemographic data of the participants, which reflect that in both groups of young tobacco users, most of them share certain characteristics that describe them as being single, students, with at least one smoking member within their family nucleus, which reside in urban areas and with a high socioeconomic level, the results obtained as a whole confirm what has been described in several studies in analogous and different contexts, which indicate that in Mexico in the case of adult smokers over 18, the prevalence is 30.2% (12.9 million) in the urban area and the predominant gender is the male with a percentage of 45.3% and 18.4% in women. As for the age of the current smokers of the urban area, almost all are young people are 18 to 29 years old, with a history of smoking within their environment and with a higher level of schooling [14].

Table 2 shows the distribution of quantitative sociodemographic variables by groups, finding that for age and 7 school years there were no

differences between groups ($P > .5$). The mean of 13 years of schooling corresponds to the first year of university.

Regarding the study variable self-efficacy level prior to the health promotion intervention, there are statistically significant differences ($P < .05$) although we must take into account the selection bias, since it is an invitational sample. However, in relation to the variable cigarettes consumption

there are no differences between groups ($P > .05$).

Table 3 shows the distribution of self-efficacy by groups, finding that before the intervention, the predominant self-efficacy in the experimental group was low (54%), unlike the control group, where the prevalence was high (66.7%) ($P < .05$). After the intervention, the predominant self-efficacy in the experimental group was high

Table 1. Distribution of categorical sociodemographic characteristics by group

Variables	Experimental group (n=50) n %	Control group (n=51) n %	X ²	df	P-value
Gender			4.6	1	.03
Male	44 88.0	36 70.6			
Female	6 12.0	15 29.4			
Civil status					
Single	48 96.0	50 98.0	0.6*		.6
Married	1 2.0	1 2.0	-0.01*		.9
Free union	1 2.0	0 0.0	-1.01*		.3
Occupation					
Employee	1 2.0	2 4.0	0.57*		.6
Student	49 98.0	46 90.2	-1.66*		.1
Professional	0 0.0	3 5.8	1.74*		.1
Religion					
Catholic	31 62.0	39 76.5	1.6*		1.1
Protestante	0 0.0	1 2.0	1.0*		.3
Christianism	3 6.0	2 4.0	-0.5*		.6
Other	16 32.0	9 17.5	-1.7*		.1
Residence area			.002	2	.9
Urban	43 86.0	44 86.3			
Sub-urban	3 6.0	3 5.9			
Rural	4 8.0	4 7.8			
Socioeconomic level					
Low	1 2.0	0 0.0	-1.2*		.3
Middle	8 16.0	10 19.6	0.5*		.6
High	41 82.0	41 80.4	-0.3*		.8
Smokers in family			1.10	1	.3
Yes	38 76.0	43 84.3			
No	12 24.0	8 15.7			

df degree of freedom

Table 2. Distribution of quantitative sociodemographic characteristics by group

Variables	Experimental group (n=50)	Control group (n=51)	t	df	P-value
Age (years)			-0.71	99	.5
Range	20 – 27	20-30			
Mean	21.5	21.8			
SD	1.5	2.6			
Years of school			-0.31	99	.8
Range	11-19	11-18			
Mean	13.7	13.8			
SD	1.4	1.8			

SD Standard deviation df degree of freedom

Table 3. Distribution of self-efficacy by group, pre and post intervention

		Pre intervention		X ²	df	P-value
	Experimental group (n=50) n %	Control group (n=51) n %				
Self-efficacy				4.39	1	.04
High	23 46.0	34 66.7				
Low	27 54.0	17 33.3				
		Post intervention		X ²	df	P-value
	Experimental group (n=50) n %	Control group (n=51) n %				
Self-efficacy				2.54	1	.01
High	37 74.0	25 49.0				
Low	13 26.0	26 51.0				

df degree of freedom

(74%) and in the control group was low (51%) ($P < .05$), and OR= 2.96 and IC95%=1.28 to 6.84.

Table 4 shows the smoking distribution per group; ($P = .8$), but with a statistically significant difference after the intervention ($P = .0001$).

To determine the effect or strength of association of the intervention on the level of self-efficacy, a logistic regression model was generated between belonging to the experimental and comparison group, between the category of cigarette consumption, obtaining a value of OR = 0.20 with a 95% confidence interval of 0.08 to 0.46, which means that those who participated in the experimental group had 80% lower possibility of high cigarette consumption.

None of the Sociodemographic variables acted as confounders or effect modifiers, demonstrated with the Likelihood Ratio Test (LRT) with $P > .05$ in all Sociodemographic variables.

Pender in her Model of Health Promotion, states that individual characteristics and experiences, as well as specific knowledge affect of behavior, lead the individual to participate or not in health

behaviors. That is, the way in which relevant aspects intervenes in the modification of human behavior [15].

For this theorist, self-efficacy plays a very important role in the acquisition of healthy habits of life, this term constitutes one of the most important concepts in this model because it represents the perception of competence of oneself to execute a certain behavior, as it is greater Increases the likelihood of a commitment to action and the actual performance of the behavior. Perceived self efficacy results in fewer perceived barriers to specific health behavior [15].

Bandura [16], Bandura [17], points out that people with high expectations of self-efficacy to solve a problem are more efficient people than those who have low expectations of self-efficacy. In fact, perceived self-efficacy functions as a predictor of behavior, as it is a powerful determinant of smoking. Laguado-Jaimez et al. [18], point out that the young people exposed to the intervention on self- efficacy (experimental group) had 80% lower possibility of high cigarette consumption than the comparison group.

Table 4. Distribution of consumed cigarettes by group, pre and pos intervention

		Pre intervention		X ²	df	P-value
	Experimental group (n=50) n %	Control group (n=51) n %				
Consumed cigarettes				.08	1	.8
High	34 68.0	34 66.7				
Low	16 32.0	17 33.3				
		Postintervention		X ²	df	P-value
	Experimental group (n=50) n %	Control group (n=51) n %				
Consumed cigarettes				15.07	1	.0001
High	15 30.0	35 68.6				
Low	35 70.0	16 31.4				

df degree of freedom

This evidence and reaffirms that when people perceive themselves as effective, their anticipatory anxiety and inhibitions are reduced, that is, an individual believes that he has sufficient resources to achieve a goal.

In this context Ornelas et al. [19], refer that it is not enough to be able to do so; But it is necessary to judge oneself capable of using personal capacities and abilities in very different circumstances, that people's perception of their own efficacy rises as a fundamental requirement to successfully develop actions leading to the achievement of personal goals. This self-perception, called self-efficacy, exerts a profound influence on the choice of tasks and activities, on the effort and perseverance of people when faced with certain challenges, and even on the emotional reactions they experience to difficult situations.

Olivari et al. [14], in the study carried out in the city of Concepción, where general self-efficacy and tobacco consumption in adolescents were correlated, had a mild correlation in women ($r = 0.30$).

Lira-Mandujano et al. [9], when evaluating a brief motivational intervention program for smokers, emphasizing the strengthening of self-efficacy and behavioral change in cigarette smoking, reported there are specific effects on the pattern of consumption, eg subjects with dependence severe of nicotine had an abrupt decline in the first 30 days of treatment, an increase at the end and then a stable pattern, and subjects with non-high dependence showed an immediate decrease during the treatment phase where smoking abstinence was achieved which is maintained after the third session in the treatment and follow-up phase.

Another element that was considered important to evaluate the impact of the intervention was the perception of the level of self-efficacy; The scores obtained showed an overall increase in confidence. Lira-Mandujano et al. [9], performed an analysis of the results with the Wilcoxon test at the level of self-efficacy; ($Z = 2.203, P < 0.05$), physical discomfort ($Z = 2.492, P < 0.05$), conflict with others ($Z = 2.556, P < 0.05$) and pleasant moments with others ($Z = 2.670, P < 0.05$).

Morales-Dominguez et al. [20], when examining the relationship between self-efficacy and temptations in smoking among university students, resulted in a higher level of

dependence on tobacco use and higher temptation Perceived self-efficacy.

Both studies, [9,20], agree with the results from Celaya investigation, which were that, at a higher level of self-efficacy, less predisposition for the consumption of harmful substances.

Relating these results to the theory of Nola Pender, she takes up in her Health Promotion Model the individual characteristics and experiences, as well as the assessment of health beliefs, since the latter are decisive when deciding to assume a healthy behavior or a risk to health. These beliefs in health are related to the previous knowledge and experiences that determine the behaviors adopted by the person; According to Pender, these beliefs are modulated by the level of self-efficacy [1].

The relation to the term self-efficacy, according to Bandura [16], Bandura [17], has found in numerous studies where the persons who are perceived themselves competent in a particular domain will repeatedly perform the behavior in which they are excellent; Self-efficacy is a system that provides mechanisms of reference that allow the perception, regulation and evaluation of behavior, giving individuals a self-regulating capacity over their own thoughts, feelings and actions. Positive or negative feelings accompanied by an emotional component are key to identifying the behavior that needs to be modified.

Therefore, self-efficacy contributes, according to the results obtained in the study to establish relation with the consumption of tobacco in the population of young people studied.

Data analysis confirms the effectiveness of the health promotion intervention in reducing smoking behavior, therefore, it can be said that the intervention has been shown to be effective in increasing the level of self-efficacy in program participants. Overall, the analyzes showed that participation in the experimental group provided positive results in young smokers with a low level of self-efficacy, ie, health promotion intervention through education, motivation and emotional management strategies proved to be effective For the improvement of the level of self-efficacy and the decrease of tobacco consumption in the young.

The study has as strength the fact that there were no losses of follow-up and as weaknesses

the presence of selection bias, when the subjects were recruited for invitation.

4. CONCLUSION

For Nola Pender self-efficacy plays a very important role in the acquisition of healthy habits of life, this term constitutes one of the most important concepts in this model because it represents the perception of competence of oneself to execute a certain behavior, as it increases the likelihood of a commitment to action and the actual performance of the behavior [21].

In relation to the general objective, it can be concluded that self-efficacy understood as the personal judgment regarding the abilities to carry out a certain behavior successfully, is considered as a protective factor in the young smokers intervened after the health promotion intervention. Because this construct has been positively correlated with optimism, self-esteem, self-regulation, quality of life, positive affects, resistant personality, coping, motivation and above all with the choice of healthy behaviors. The good thing about increasing self-efficacy in a person, is that this increase will be transmitted to the other aspects of their life will be achieved strengthen this self-efficacy and therefore prevention programs will be more successful.

CONSENT

All participants signed the consent form to participate in the study.

ETHICAL APPROVAL

The protocol was reviewed and approved by Bioethics Committee of Division of Health Sciences and Engineering, Campus Celaya Salvatierra, University of Guanajuato con the registry CBDCSI-32140226

ACKNOWLEDGEMENTS

Authors want to thank all participants, without them the study it would not have been possible. Research network on global health from a interdisciplinary in focus, to participate in this study with three members.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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DOI:10.1016/S0300-2896(01)75032-6

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