

Original Research Article

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

ABSTRACT

Aim: The objective was to determine 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 informed 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-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,

31 associated with habits and customs, that do not produce the disease immediately, but over
32 time, such as smoking [2].

33 Smoking, according to Official Mexican Standard NOM-028-SSA2-1999, is dependence or
34 addiction to tobacco [3]. The Global Adult Smoking Survey (GASS) conducted in Mexico in
35 2009, reported that 15.9% (10.9 million) of adults in Mexico were smokers, 24.8% of men
36 (8.1 million) and 7.8% (2.8 million) of women [4]. In Guanajuato state, according to the
37 National Addiction Survey from 2008, 23.2% of the population (almost 632,000 people) are
38 active smokers [5].

39 Among the personal factors that can be related to smoking in young people are self-efficacy
40 and self-esteem; That is, a low self-efficacy predicts substance use and abuse, including
41 tobacco as reported by authors such as Cortes et al. [6], where they reported that the daily
42 consumption of tobacco was 22.9% in men and 36.2% in women; The factors associated
43 with regular tobacco use were self-efficacy and attitudes.

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

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

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

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

62 Perceived self-efficacy in the area of health is important in the prevention of risky behaviors
63 and in the promotion of behaviors that benefit people; Cid et al. [11], reported that perceived
64 self-efficacy correlates positively with optimism, self-esteem, self-regulation, quality of life,
65 positive affects, perceived competence, resilient personality, task-centered coping, and
66 satisfaction, which are essential elements in behavioral changes in health.

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

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

75 2. MATERIAL AND METHODS

76

77 2.1 Study design

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

79 2.2 Place and universe

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

85 2.3 Selection of subjects.

86 **2.3.1 Inclusion criteria.** Young adults with age between 20-30 years, both genders, who
87 accepted to participate signing the informed consent and smoke at least one cigarette at
88 day.

89 **2.3.2 Exclusion criteria.** Those with verbal, hearing, and motor communication problems
90 that were not present at the time of data collection and those who were in treatment for the
91 reduction of tobacco consumption were not included.

92 2.4 Variables

93 **2.4.1 Sociodemographics.** It was measured age, gender, civil status, residence, and
94 socioeconomic level.

95 **2.4.2 Independent variable.** It was the intervention program at experimental group.
96 At control group, the intervention was applied, once the study was concluded.

97

98 **2.4.2 Dependent variables.**

99

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

104

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

109 2.5 Instruments

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

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

122 **2.6 Procedures**

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

128 **2.7 Intervention**

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

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

144 **2.8 Sample size**

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

148

149 **2.9 Statistical analysis**

150 Descriptive statistics were used for sociodemographic variables. To test hypotheses, Z for
151 two independent proportions was performed, and to identify the effect of the intervention on
152 smoking, we used Odds Ratio (OR) and 95% confidence intervals. To prove statistical
153 significance of the results the value of *P* was set at .05. Statistical analysis was performed
154 on STATA 13.0 ® (Stata Corp. College Station, TX, USA).

155

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 1 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
High	8	16.0	10	19.6	0.5*		.6

Middle	41	82.0	41	80.4	-0.3*	.8
High						
Smokers in family					1.10	1
Yes	38	76.0	43	84.3		.3
No	12	24.0	8	15.7		

180 df degree of freedom

181 Table 2 shows the distribution of quantitative sociodemographic variables by groups, finding
 182 that for age and 7 school years there were no differences between groups ($P > .5$). The
 183 mean of 13 years of schooling corresponds to the first year of university.

184 Regarding the study variable self-efficacy level prior to the health promotion intervention,
 185 there are statistically significant differences ($P < .05$) although we must take into account the
 186 selection bias, since it is an invitational sample. However, in relation to the variable
 187 cigarettes consumption there are no differences between groups. ($P > .05$).

188 **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			

189 SD Standard deviation df degree of freedom

190 Table 3 shows the distribution of self-efficacy by groups, finding that before the intervention,
 191 the predominant self-efficacy in the experimental group was low (54%), unlike the control
 192 group, where the prevalence was high (66.7%) ($P < .05$). After the intervention, the
 193 predominant self-efficacy in the experimental group was high (74%) and in the control group
 194 was low (51%) ($P < .05$), and OR= 2.96 and IC95%=1.28 to 6.84.

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

Pre intervention					
	Experimental group (n=50) n %	Control group (n=51) n %	X ²	df	P- value
Self-efficacy			4.39	1	.04
High	23 46.0	34 66.7			
Low	27 54.0	17 33.3			
Post intervention					
	Experimental group (n=50)	Control group (n=51)	X ²	df	P- value

	n %	n %			
Self-efficacy			2.54	1	.01
High	37 74.0	25 49.0			
Low	13 26.0	26 51.0			

196

197 df degree of freedom

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

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

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

df degree of freedom

201

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

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

211 Pender in her Model of Health Promotion, states that individual characteristics and
212 experiences, as well as specific knowledge affect of behavior, lead the individual to
213 participate or not in health behaviors. That is, the way in which relevant aspects intervenes
214 in the modification of human behavior [15].

215 For this theorist, self-efficacy plays a very important role in the acquisition of healthy habits
216 of life, this term constitutes one of the most important concepts in this model because it
217 represents the perception of competence of oneself to execute a certain behavior, as it is
218 greater Increases the likelihood of a commitment to action and the actual performance of the

219 behavior. Perceived self efficacy results in fewer perceived barriers to specific health
220 behavior [15].

221 Bandura [16], Bandura [17], points out that people with high expectations of self-efficacy to
222 solve a problem are more efficient people than those who have low expectations of self-
223 efficacy. In fact, perceived self-efficacy functions as a predictor of behavior, as it is a
224 powerful determinant of smoking. Laguado-Jaimez et al. [18], point out that the young
225 people exposed to the intervention on self-efficacy (experimental group) had 80% lower
226 possibility of high cigarette consumption than the comparison group. This evidence and
227 reaffirms that when people perceive themselves as effective, their anticipatory anxiety and
228 inhibitions are reduced, that is, an individual believes that he has sufficient resources to
229 achieve a goal.

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

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

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

247 Another element that was considered important to evaluate the impact of the intervention
248 was the perception of the level of self-efficacy; The scores obtained showed an overall
249 increase in confidence. Lira-Mandujano et al. [9], performed an analysis of the results with
250 the Wilcoxon test at the level of self-efficacy; ($Z = 2.203$, $P < 0.05$), physical discomfort ($Z =$
251 2.492 , $P < 0.05$), conflict with others ($Z = 2.556$, $P < 0.05$) and pleasant moments with others
252 ($Z = 2.670$, $P < 0.05$).

253 Morales-Dominguez et al. [20], when examining the relationship between self-efficacy and
254 temptations in smoking among university students, resulted in a higher level of dependence
255 on tobacco use and higher temptation Perceived self-efficacy.

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

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

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

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

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

281 The study has as strength the fact that there were no losses of follow-up and as weaknesses
282 the presence of selection bias, when the subjects were recruited for invitation.

283 **4. CONCLUSION**

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

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

298 **COMPETING INTERESTS**

299 Authors have declared that no competing interests exist.

300 **CONSENT**

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

302 **ETHICAL APPROVAL**

303
304 The protocol was reviewed and approved by Bioethics Committee of Division of Health
305 Sciences and Engineering, Campus Celaya Salvatierra, University of Guanajuato con the
306 registry CBDCSI-32140226

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