

Special Article – Tobacco and Smoking Cessation

Assessment of Medical Intervention in the Intention to Quit Tobacco in Uruguay, Argentina y Brazil: Tobacco Control Policy Effects

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Purpose: This work is aimed at evaluating the effectiveness of medical intervention in encouraging tobacco quitting, controlling for the characteristics of those who try to quit.

Methods: Using data from the Global Adult Tobacco Survey (GATS) in Argentina (2012), Brazil (2008) and Uruguay (2009), logit models are estimated taking into account the characteristics of smokers and medical intervention in consultation as explanatory variables of motivation to quit tobacco.

Results: In Uruguay and Brazil controlling for smoker's characteristics, like age, gender, education, type of employment, and smoking frequency, those that have consulted a doctor and within this group who have received brief medical advice are more likely to try quitting. In Uruguay and Argentina we find that people under 45 years have a higher rate of intention to quit than average, although they receive a smaller proportion of brief medical advice than other age groups.

Conclusions: Most intention to quit in Uruguay and Argentina in groups of young people cannot relate to medical advice, so it is postulated that other tobacco control policies such as health warnings on cigarettes packs, smoke free areas, to which in the case of Uruguay tobacco tax increases and the ban on advertising, promotion and sponsorship of tobacco products are added. The cost-effectiveness of tobacco cessation programs tobacco could improve if the proportion of people receiving brief medical advice in the younger age tranches is increased and are designed comprehensive programs that include the management of other risks.

Keywords: Tobacco cessation; Brief medical advice; Cost-effectiveness; Tobacco use disparities; Medical intervention effectiveness

Abbreviations

GATS: Global Adults Tobacco Survey; ANOVA: Analysis of Variance; OR: Odds ratio

Introduction

The consumption of tobacco is the most important cause of preventable deaths worldwide [1], and the prospects are that the epidemic is concentrated in developing countries, because the tobacco industry has focused its efforts to increase sales in them because they have a huge population with rising incomes, a high percentage of young people, and fewer regulations than developed countries. The World Health Organization estimates that by 2030 will die 8 million people annually due to consumption of tobacco, and 80% of them will occur in developing countries [2].

The literature reviewed shows that when taking into account the prevalence by education level, income, occupation and place of residence, tobacco consumption and related diseases affect disproportionately to people of low socioeconomic strata [3-5].

In Montevideo there are neighbourhoods, where live people of

low socio-economic strata, whose prevalence is more than double, compared to other districts of the city [6].

A factor that may contribute to the tobacco consumption disparities is that quitting rates are different according to socio-economic strata. Studies that have examined quitting rates in relation to smoker's socio-economic strata determined that the lower income or educational level less likely the smoker will succeed in quitting tobacco, and vice versa, that the higher education or income of people, the higher probability of success [7-9]. When a group of people has a higher prevalence of tobacco than average, interventions targeting these groups could reduce prevalence disparities [10-14].

Regarding intention to quit tobacco, there is no conclusive evidence about its relationship with the socio-economic strata. Studies in Australia, Canada and the United Kingdom [15] indicate that the higher the level of education or income more likely people will try to quit, but other works, also conducted in these countries and in the United States, not found such relationship [16,17].

The motivation to quit is an essential aspect for smoking cessation programs to achieve greater impact in reducing prevalence. Simple

Table 1: Odds ratio estimates from logit models.

Variables	Odds Ratio (OR)					
	Uruguay		Argentina		Brazil	
	Visited to the doctor	Received brief medical advice	Visited to the doctor	Received brief medical advice	Visited to the doctor	Received brief medical advice
<i>Age (ref. <=25 years old)</i>						
26 a 35 years old	0,511***	0,358***	0.643*	0.573	1.026	0.834
36 a 45 years old	0.708	0,714	0.378**	0.335	0.776**	0.743
46 a 59 years old	0,538***	0,362***	0.702	0.697	0.800**	0.677**
60 years old and more	0,248***	0,192***	0.786	1.074	0.749**	0.620**
<i>Education (ref. primary school/ without formal education(Brazil))</i>						
Primary school	---	---	---	---	1.447***	1.249
High school	0,776*	0,794	0.698	1.025	1.217*	1.002
University/Teacher	0,558***	0,416***	0.447***	0.670	0.929	0.887
Smoking frequency (ref. daily smoker)	1,560**	2,356**	1.380	0.792	0.808*	1.123
Visited to the doctor (ref. no visited to the doctor)	2,621***	---	0.839	---	1.666***	---
Received brief medical advice (ref. no received brief medical advice)	---	2,347***	---	0.983	---	1.274*
Gender (ref. man)	0.821	1.041	1.063	1.849	1.159**	1.128
<i>Employment (ref. government employee)</i>						
Private employee/self-employed	1.107	0.667	0,462*	0.599	0.856	1.003
Student	0.409	0.176**	0.596	1.395	---	---
Housewife/retired/unemployed	1.238	0.638	0.297***	0.483	0.794	0.924
Constant	0,853	2,516	3.323**	1.074	0.577***	1.009
Sample size	N=1394	N=545	N=1632	N=516	N=5026	N=2158

Statistical significance: 1%*** 5%** 10%*.

interventions that increase smoker's motivation to quit could improve the cost-effectiveness of cessation programs.

This paper aims to evaluate the effectiveness of interventions that encourage smokers to quit tobacco, such as medical consultation and brief advice, controlling for socioeconomic and personal characteristics of those who intent to quit tobacco. Also it examines whether the intention of quitting is different depending on age tranches and if this is related to brief medical advice.

Materials and Methods

In Uruguay, Argentina y Brazil GATS is a national survey with urban and rural strata coverage. GATS was conducted as a household survey of people aged 15 years and older by the National Institute of Statistics of each country. In Uruguay an initial sample of 6558 households, completing 5591 individual interviews; in Argentina a sample of 9790 households carried out 6645 individual interviews and in Brazil the sample of 51011 households includes 39425 interviews [18-20].

A multi-stage cluster stratified sampling, designed to produce nationally representative data was used in all three cases. An individual was identified in each household randomly selected to participate in the survey. The response rate in households was 79.2%, 97.0% and 95.0%, the individual response rate was 93.8%, 98.5% and 98.9%, and the average response rate was 74.3%, 95.6 % and 94.0% in Argentina, Uruguay and Brazil respectively.

The *dependent variable* explained by the logit models is:

Intention to quit: Intent to quit smoking in the last 12 months, dichotomous categorical variable (0 do not try to quit, 1 try to quit).

The *independent variables* of logit models to estimate are [21-30]:

Age: Five dichotomous categorical variables are used, one for each tranche age, is 1 in each age tranche and 0 otherwise; the age tranches are up to 25 years old, between 26 y 35 years old, 36 and 45 years old, 46 and 59 years old, and 60 or more years old respectively.

Education: Three dichotomous categorical variables are used (Argentina and Uruguay), one for each education level, is 1 in the educational level and 0 otherwise; the categories are up to primary school, up to high school/technical school, up to university/high school teacher/technical school teacher respectively. In the case of Brazil four categorical variables are used, an additional variable is used for those without formal education.

Visit to the doctor: Visit to the doctor in the last 12 months. Dichotomous categorical variable, (0 do not visit to the doctor, 1 visit to the doctor).

Receive brief medical advice: Receive medical advice to quit, dichotomous categorical variable (0 do not receive brief medical advice, 1 receive brief medical advice).

Smoking frequency: Daily smoker or occasional smoker,

Table 2: Probabilities of try quitting for smokers do not received brief medical advice.

Age tranche	Uruguay		Brazil	
	Without brief medical advice	If they had received brief medical advice	Without brief medical advice	If they had received brief medical advice
25 years old or less	53.6%	71.7%	50.9%	56.9%
26 to 35 years old	36.6%	56.8%	46.6%	52.7%
36 to 45 years old	53.7%	72.9%	44.4%	50.5%
45 to 59 years old	37.1%	57.8%	43.2%	49.1%
60 years old or more	25.8%	44.6%	41.5%	47.5%
Whole sample	42.4%	62.0%	45.4%	51.4%

dichotomous categorical variable (0 daily smokers, 1 occasional smoker).

Gender: Man or woman, dichotomous categorical variable (0 man, 1 woman).

Employment: Four categorical variables are used, one for each type of employment; the four types of employment are: government employee, private employee/self-employed, student (this category just to Uruguay and Argentina), housewife/retired/unemployed.

On the one hand, logit models are estimated to determine which personal characteristics and socio-economic have those who have tried quitting, and on the other hand, if medical interventions (medical consulting and brief medical advice) have an effect on those who have tried to quit tobacco. An analysis of variance (not reported) was performed to know if there are statistically significant differences among explanatory variables. After the ANOVA, binary logistic regression and odds ratios (relative risks) are estimated.

Results and Discussion

For each country the first logit is estimated using as an independent variable visit to the doctor in the last 12 months; the results are presented in Table 1.

In all three countries, belonging to an older age group decreases the probability of try to quit compared to the reference group (25 years or less), however in Argentina the coefficients for the age tranches of 45 to 59 and 60 or more years old are not significant.

Having reached university in Uruguay and Argentina, as well as high school in Uruguay reduces the likelihood of trying to quit smoking compared to those with primary education. Having just primary school, or even high school in Brazil, increases the likelihood of quitting compared to those with no formal education.

Having visited the doctor in the last year increases the probability of intent to quit tobacco in Uruguay and Brazil, in Uruguay the respective OR increases 162.1% and in Brazil 66.6% compared to those who have not visited a doctor. In the case of Argentina this does not affect the probability of intent to quit.

In Uruguay being an occasional smoker increases the OR of intent to quit at 1.56 times but in Brazil the OR decreases 0.808 times regarding to those who smoke daily. In Argentina to be daily or occasional smoker is not a significant variable in relation to the intention of quitting.

In Uruguay and Argentina gender does not significantly

influences the intention of quitting, although in Brazil being a woman increases the OR 15.9%.

Having visited the doctor in the last 12 months is a fact that could partly be determined by people's health and partly due to his concern about his health. Therefore the results found for Uruguay and Brazil suggests that these two aspects or at least some of them could influence the intention to quit smoking; and that in Argentina these aspects would not influence in the intentions to quit.

In either of the two hypotheses about why the doctor attendance means that at least in Uruguay and Brazil health professionals would be in key position to encourage smoker's intention to quit. In the second model estimated examines whether the brief physician advice is an act that helps people try to quit smoking.

A common result to the three countries is that the younger the smoker the more likely he will try to quit, and in Uruguay and Brazil this probability is even greater for those who have visited the doctor. Strikingly in Argentina visiting the doctor does not seem to affect the likelihood of thinking about quitting.

Those who visit the doctor in the last 12 months were asked if they had received brief advice to quit tobacco. For each country, a new model similar to the previous logit model was estimated by replacing the dependent variable *visit to the doctor* for the variable *receive brief medical advice* [31,32], (Table 1).

In this second model estimated, for those smokers who visited the doctor in last 12 months and received brief medical advice the OR increased 134.7% in Uruguay and 27.4% in Brazil, compared to those who did not receive such advice. Consistently with the result of the doctor's visit in Argentina, brief medical advice is not statistically significant to encourage quitting.

This suggests that in Uruguay and Brazil, but not in Argentina, brief medical advice is a very important medical intervention to encourage quitting smoking because it significantly changes the probability of try to quit among smokers who have visited a doctor in the last year.

Using the second model estimated, the probabilities of try to quit for people who have not received brief advice are calculated (Table 2). Then we simulated the probabilities of try to quit for those persons on the assumption if they had received brief medical advice (for Uruguay and Brazil).

At a general level, in Uruguay the impact of brief medical advice could be very important in people that have not received brief

quit in Uruguay and Brazil in the group of 60 years old or more is lower than this core set of observations.

In Brazil the intention to quit in the first four age groups is concentrated in the central ellipse with values that are not statistically different.

In Argentina and Uruguay it is observed a greater dispersion of the intention to quit in the first four age groups, with three age tranches whose percentage rate of intention to quit is greater than the core group. Of these three cases two correspond to the group of up to 25 years in Argentina and Uruguay and the third is the group between 36 and 45 years in Uruguay. This higher intention to quit in young individuals cannot be explained only by brief medical advice, because they receive brief medical advice in equal or lower proportion than the average of the other groups.

An alternative explanation is that in Uruguay and Argentina (maybe also in Brazil) tobacco control policies have encouraged quitting through pictograms in cigarettes packs, smoke free public, and in Uruguay due to higher tobacco taxes and ban on advertising, promotion and sponsorship of tobacco products.

Conclusions

The present study confirms that medical consultation and brief medical advice to quit tobacco use are effective to encourage quitting in Argentina, Brazil and Uruguay.

However, it should work for young people that attend to the doctor receive brief medical advice, at least, in similar proportions like people in other age tranches. Brief advice should be tailored to the needs and characteristics of this population and form part of a comprehensive strategy for health promotion and disease prevention.

This strategy should include addressing threats and concerns to the health of young people like overweight, alcohol consumption, stress and anxiety management, etc., that help and encourage them to develop a healthier lifestyle.

This comprehensive approach could enhance cost-effectiveness of medical interventions because they are people who are mostly healthy, with larger healthy years to gain. Therefore the health gain could be bigger with a higher impact in order to reduce direct and indirect costs of tobacco epidemic.

Furthermore health programs designed for youth with a comprehensive approach that help to manage or avoid other risks besides tobacco, could imply a gain in cost-effectiveness of such comprehensive programs because are increased the risks quantity that are prevented.

Strikingly in Uruguay and Argentina we find that intention to quit is greater in smokers of low socioeconomic strata, which contrasts with some evidence for developed countries. This implies that in these two countries disparities generated by tobacco consumption could be reduced if it is achieved that the intentions of quitting become into effective quit attempts. This finding implies that current national programs of cessation are an important tool to encourage quitting, and should be strengthened and focused on smokers of low socioeconomic strata and youth.

In Brazil the intention of quitting is higher in groups with up to primary or high school in relation to those without formal education, so that specific interventions should be developed on the latter to reduce the disparity in tobacco consumption.

Additionally, reduce tobacco use disparities requires apply a set of tobacco control measures which reach great masses of the population with low education and income; this especially means to decrease the affordability of tobacco products, through increased of tobacco taxes and reducing the availability of illegal cigarettes which are mainly consumed by these social groups.

More research is needed to determine the reasons why the intention of quitting is higher in groups of young people in the three countries, and know what aspects concern to this group of people for the purpose of developing appropriate and effective interventions. Especially discriminate the weight given by them to risks with more immediate effects in relation to risks with effects of longer term as smoking or not exercising.

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