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## Brief Report

# The Association of the Transitions in Smoking Stages with Prevalence of Cigarette Smoking in the Classes and Schools: A Longitudinal Study

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## ABSTRACT

**Background:** Adolescent tobacco use remains a major public health priority to reduce the prevalence of tobacco use in community. The aim of this study was determining the association of the transitions in smoking stages with prevalence of cigarette smoking in the classes and schools in adolescents of Tabriz City (northwest of Iran).

**Methods:** Fifty-six high schools were randomly selected, and 4903 students completed a self-administered questionnaire on cigarette smoking twice with a 12-months interval in 2010 and 2011.

**Results:** Transition from experimenter to regular smoker stage was associated with the prevalence of cigarette smoking in the school.

**Conclusions:** The results have shown the association of student's smoking uptake with the prevalence of cigarette smoking in the school. This highlights the importance of enforcing smoke free policies in schools.

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## Introduction

Adolescent tobacco use remains a major public health priority in society. Evidence suggests that environmental influences, particularly social influences, are related to youth smoking behavior<sup>1</sup>. School and community characteristics account for variation in smoking levels across schools. Lovato et al<sup>2</sup> showed that students who attended a school with a focus on tobacco prevention and stronger policies prohibiting tobacco use were less likely to smoke than students who attended a school without these characteristics. A student was more likely to smoke if a greater number of students smoked on the school periphery. Besides, Wakefield et al<sup>3</sup> showed that school smoking bans were related to a greater likelihood of being in an earlier stage of smoking uptake.

There has been no study on how the prevalence of cigarette smoking in the class and school might influence student cigarette smoking stages. This report is a part of a large study on smoking stages in adolescents that presents the association of prevalence of cigarette smoking in the classes and schools with transitions in three smoking stages. This can be useful to develop an effective strategy to prevent adolescents smoking.

## Methods

The sampling method of the present study was multistage random proportional cluster sampling. Fifty-six high schools were randomly selected by considering type of schools and gender of students and 196 classes (82 and 114 boys and girls classes respectively) were randomly selected by considering the major and total number of students in each school. All students of these classes were entered into the study as clusters. The students were assessed at 2 time points with a 12-months interval in 2010 and 2011. A self-administered questionnaire included questions about smoking status was used for data collection.

Students were classified in three stages of cigarette smoking continuum according to the Kaplan et al.<sup>4</sup> as follows: (a) Never Smoker: adolescents who have never smoked (even a puff); (b) Experimenter: adolescents who have tried the cigarette (even a puff), but have smoked less than 100 cigarettes in lifetime; and (c) Regular smoker: adolescents who have smoked 100 cigarettes and more in lifetime, without considering their present consumption. Any transitions from never smoker to experimenter or to regular smoker and from experimenter to regular smoker were considered. More details about study design, sampling method

and questionnaire were presented elsewhere<sup>5</sup>. Inter model of multiple linear regression was used by SPSS-16 in the statistical analysis.

## Results

Out of 5106 sampled students, 4903 (96.1%) participated in the study. From those who did not complete the questionnaire, 196 (3.7%) were absent and 7 (0.2%) did not participate in the study. After one year follow-up, 843 (17.3%) students dropped out of study. The reasons for dropping out were absence on the day of data collection (43.2%), school change (41.5%), dropout from school (9.4%) and unknown (5.9%). The mean age of the students was  $15.69 \pm 0.73$  years old (Range: 14 to 19). Prevalence of cigarette smoking in the

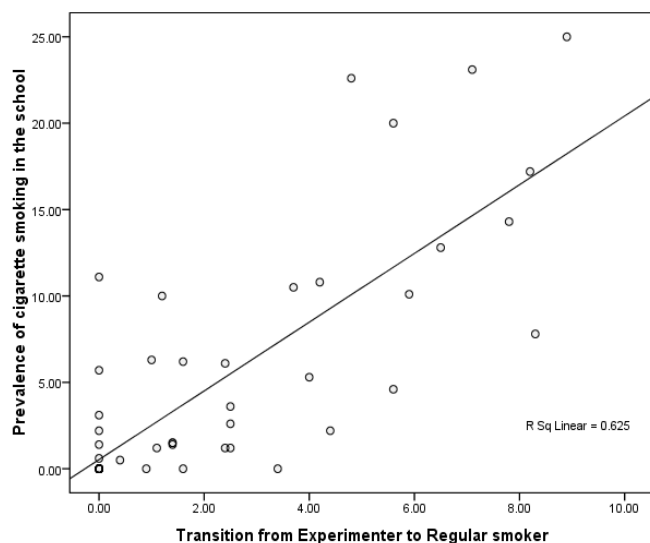
classes and schools and transitions in smoking stages were computed as percentage. In total, 17.3% of the participants were experimenters (95% CI: 15.8, 18.9) and 5.0% were regular smokers (95% CI: 3.7, 6.2).

The association of the transitions in smoking stages with prevalence of cigarette smoking in the classes and schools were presented in Table 1. Accordingly, transition from experimenter to regular smoker stage was significantly associated with the prevalence of cigarette smoking in the schools ( $\beta=0.220$ , 95% CI: 0.133, 0.307,  $P<0.001$ ). The relation of the transition from Experimenter to Regular smoker stages with prevalence of cigarette smoking in the school is shown in Figure 1.

**Table 1:** Relationship between the transition in smoking stages and prevalence of cigarette smoking in the class and school (196 classes and 56 schools)

Transitions	$\beta$	95%CI	P value
<b>Prevalence of cigarette smoking in the class</b>			
Transition from Never smoker to Experimenter	-0.064	-0.192, 0.064	0.325
Transition from Never smoker to Regular smoker	-0.017	-0.081, 0.047	0.598
Transition from Experimenter to Experimenter	0.061	-0.009, 0.132	0.089
<b>Prevalence of cigarette smoking in the school</b>			
Transition from Never smoker to Experimenter	-0.148	-0.302, 0.006	0.059
Transition from Never smoker to Regular smoker	0.086	-0.008, 0.180	0.073
Transition from Experimenter to Regular smoker	0.220	0.133, 0.307	0.001

$\beta$ : Regression coefficients adjusted for sex, educational major and type of school



**Figure 1:** Scatter plot for between prevalence of cigarette smoking in the school and transition from Experimenter to Regular smoker stages

## Discussion

The results of present study showed that the transition in smoking stages was not associated with prevalence of cigarette smoking in the class. But transition from experimenter to regular smoker stage was significantly associated with the prevalence of cigarette smoking in the schools. Reid et al.<sup>6</sup> showed that seeing smoking at school and school smoking rate were related to adolescents' estimation of peer smoking prevalence. On the other hand, researchers have demonstrated a relationship between adolescents smoking behavior and perceptions of peer smoking prevalence<sup>1,7</sup>. Furthermore, adolescent tend to overestimate the prevalence of smoking<sup>8</sup>. This causes concern that beliefs about social norms for smoking are related to youth smoking behavior, and perceived norms are actually more influential than actual smoking rates for predicting youth smoking<sup>9</sup>.

Despite longitudinal nature of study and using quite satisfactory methodology and sampling method, generalization of the study results is limited due to the study itself being limited to 10th grade students of Tabriz City. Another limitation of the present study was adjustment done only for sex, educational major and type of school, while other confounders could affect the results.

## Conclusions

The results have shown the association of student's smoking uptake with the prevalence of cigarette smoking in the school. This highlights the importance of enforcing smoke free policies in schools.

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## Conflict of interest statement

The authors declare that there are no conflicts of interests.

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