

The influence of social environment on smoking behavior among adolescents in Iran

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Abstract

Background: Research suggests that factors in the environment are major determinants of health behavior for populations. This cross-sectional study used a combination of quantitative and qualitative data collection methods to determine the prevalence of smoking and identify the possible associations between smoking and environmental variables among school pupils in Iran.

Methods: A self-reported questionnaire was administered and collected data from 2200, students 15-18 from 100 high schools who agreed to take part in the research. The sample was selected from the Iranian Education System Database using a two-stage cluster sample based on a random sample of schools and pupils as a representative sample of this population. Almost 90% of respondents had completed the questionnaires. Examination of the test-retest answers over all questions among 70 students in two weeks interval revealed reliability coefficient ranges 0.72 to 0.98. The Adjusted Enter Logistic Regression Models were applied to significant variables identified through Chi square tests. In addition, 40 of the sample took part in focus groups exploring the facilitators and barriers to smoking behavior. Content analysis was also used to extract themes from the focus group discussions.

Results: The effects of social environment variables including peers', mothers', and sisters' smoking on cigarette consumption among young people were explored in this study. Levels of cigarette availability and exposure, effects of parents' attitudes and supervision, legislation on tobacco control, expanding life opportunities and more options for leisure activities perceived as influencing factors on adolescent smoking were all highlighted in the focus group discussions.

Conclusion: The qualitative and quantitative findings revealed the impact of social environment on smoking behavior among young people. This study provides strong evidence to support environmentally oriented smoking prevention programs targeting young people.

Keywords: adolescents, cigarette smoking, social environment

Introduction

It is estimated that 84 percent of smokers live in low and middle-income countries [1]. In low and middle-income countries, tobacco related deaths are projected to rise dramatically in the future decades if the incidence of smoking is not reduced [2]. The increasing prevalence of youth smoking re-

quires critical investigation into the factors associated with this habit.

Smoking surveys in Iran, when available, are seldom representative of the country as a whole [3-6] and environmental predictors principally include social influences of parents and peers or significant others but there is little chance of finding role of macro-level determinants such as accessibility to

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tobacco products and opportunities to use it, low price cigarettes, social policy and social legislation as factors influencing smoking uptake by young people.

Environmental factors influence health and health behavior for individuals and populations [7]. A meta-analytic review of literature supported the view that favorable psychosocial environments improve health [8]. Environmental risk factors such as living in a community where there are cheap cigarettes for sale [9-10] or where smoking legislators are absent [11] or where there was a lack of clarity in implementation process makes some young people more susceptible to experiment with and use tobacco.

The Islamic Republic of Iran ratified the WHO Framework Convention on Tobacco Control at 6th November 2005 and has committed incorporating FCTC policies and recommendations into their own laws [12]. Two potential risk factors for Iran including geopolitical situation of the country and being a populous country in the age group of 15-29 [13] could serve as an ideal market for tobacco products.

The socially constructed nature of smoking in Iran has leads us to apply combined methods. In this study a quantitative approach was used to gather a large sample size to provide a reasonable basis for statistical analysis including establishing associations among variables. The quantitative research data was representative of the study population and projectable to the entire population. Qualitative research method was also applied to elicit perspectives, experiences, and suggestions from adolescents in their own words and also gain more in-depth information for unknown aspects of the topic.

Therefore, this study developed an ecological perspective to explore which variables distinguish between adolescents who smoke and those who do not and explore the different motives that may influence young people in their decision to use tobacco.

Methods

Instruments

The questionnaire was a self-administered structured one that designed in two distinct sections. It assessed demographic characteristics of the subjects, attitudes toward smoking, family and peers smoking behavior in the first section, current smoking (quantity and frequency), and lifetime smoking history in the second section. Participants were asked to complete the latter if they had ever tried smoking, otherwise leave it blank. Examination of the test-retest answers over all questions among 70 students in two weeks interval revealed reliability coefficient ranges from 0.72 to 0.98. The focus group discussions were conducted with the adolescents to describe facilitators and barriers to smoking behavior, as well as their perceptions, motivations, and expectations relating to smoking behavior.

In this study smoker is defined as someone who smoked regularly at least one cigarette per week in the past month [14]. Therefore, adolescents who smoked less than one cigarette per week have been categorized as occasional smokers. Thus, a smoker was identified as a regular or an occasional smoker (1). Those who had tried once or never smoked, or stopped smoking were considered as non-smokers (0).

The second index was a composite measure of four socio-economic status indices including highest level of education of parents and their jobs.

A composite measure of social environment factors consisted of four indexes including "Who smokes in your household?" "father", "mother", "brother", "sister",? The response categories were dichotomized coded 0 (No, don't smoke, don't have) to 1 (Yes, smokes regularly /occasionally smokes). Another item was "How many of your close friends smoke?" The response categories for these items had a three-point scale ranging from 1 (None to 3 (more than 50%). Another item was "Have you been offered cigarettes to smoke?" The response categories for this item had a two-point scale ranging from 0 (No) to 1 (Yes). The last

item was “If so, did you respond by Accepting” or Refusing?” Therefore, the response categories for this item had a three-point scale ranging from 1(Not offered), 2(Offered but refused) and 3(Offered and accepted). Higher scores on this scale signalled higher levels of vulnerability.

In focus group discussions, the researcher guided the discussion while a fellow researcher operated the tape recorder, took thematic notes, and acted as secondary facilitator. The focus groups were made up of six groups with six participants and one with four participants. Each session lasted up to 90 minutes.

The main subjects of discussion's outline were on the topics of attitudes toward smoking; reasons for starting and for never starting; perceived benefits of smoking; challenges or obstacles to quitting and maintaining abstinence. Within the outline, great flexibility was allowed as the purpose of the study was to examine the most important issues to the participants. On most occasions, however, discussions were monotonous for the participants, hence, the researcher tried to guide and encourage them for prompt collections of data and that all the important and necessary points were covered in the study.

To encourage participants to respond, the researcher began with a 5-10 minute introduction. The purpose of focus groups was defined and explanations presented on how the results would be used. The participants were assured that their information remained confidential. A couple of issues were considered to encourage groups to participate in discussions effectively. Participants were reminded that there are no right or wrong answers and researchers were interested merely in what they say about smoking issues. They were asked neither to criticize other people, nor to argue with others and that everyone was entitled to have his or her opinion.

Sample size

2200 people were selected based on an approximate prevalence of 10% smokers

with a bond on the error of estimation of 2% and 95% confidence interval and also considering a 20% of possible non-response rate, using the following equation.

$$n = \frac{z^2_{1-\alpha/2} p(1-p)}{d^2}$$

Data collection

This cross sectional study was conducted in two phases. In the first phase, 2200 students, aged 15-18 filled out the self completion questionnaires anonymously and confidentiality during school hours. The participants were selected by two-stage cluster sampling stratified by sex and location from 100 schools across Tehran in 2004-2005, ensuring representation of large urban areas. The ethics committees of Ministry of Health and other relevant national regulatory organizations approved the study. Students were informed about the research and provided their voluntary consents before becoming research participants. The participants' privacy and the opportunity to withdraw from the research were honored. During the completion of the questionnaires at the first stage, participants were informed that several focus group sessions would be conducted as post survey. The adolescents interested in participating were asked to give contact information for this purpose.

The second phase of study was issues raised by the focus groups. All groups constituted a single-sex and 70 percent of participants in focus groups were non-smokers.

The qualitative sample was big enough to assure that we are likely to hear most or all of the perceptions that might be important but not to the extent that could fail discovering a perception under question. Of the fifty-two adolescents, who accepted to participate, twelve refused to take part. Therefore, forty adolescents of the sample took part in focus groups.

In focus group discussions, the researcher involved with each group of participants in an effort to get proper information on the smoking issues. This method was used to find out the various issues related to smoking habit. During the sessions, the researcher

Table 1. Socio- demographic characteristics and adolescents smoking

Variables	Non smokers No (%)	Smokers No (%)	P value
Age (years)			
15	347(96.4)	13(3.6)	0.006
16	528(95.3)	26 (4.7)	
17	589 (92.0)	54 (8.4)	
18	590 (92.0)	51(8.0)	
Gender			
Males	970 (89.9)	112 (10.1)	<0.001
Females	1085(97.0)	32(3.0)	
Father's education			
Up to Diploma	799(95.6)	37(4.4)	0.002
Diploma	763 (93.3)	55(6.7)	
University degree	466 (90.7)	48 (9.3)	
Mother's income			
Unpaid in family	1752 (93.9)	113 (6.1)	0.010
Middle	223(92.5)	18 (7.5)	
High	81 (86.2)	13 (13.8)	

observed how participants reacted and discussed the issues and ideas together. The notes about the topics and discussions were recorded using audio tape. Then the records were transcribed into verbatim. The transcripts were read several times to identify themes and categories and a coding frame was developed after each discussions. If new codes emerged the coding frame was changed and the transcripts were reread according to the new structure. This process was used to develop categories. Emerging categories were developed by studying the transcripts repeatedly with consideration of possible meanings and how these fitted with developing themes. The process of checking and questioning the emerging themes was continued until identical themes repeated reading and analysis emerged [15].

Statistical tests

The value of Chi square (χ^2) and p value (at $p < 0.05$) of variables were calculated and then significant variables entered into the Enter Logistic Regression Models.

The crude logistic regression models were adjusted for four variables as the first set of predictor variables in the regression equations, namely gender, age, father's education, mother's income as these variables showed a highly significant association with adolescent smoking using chi square analysis (see Table.1).

Analyzing qualitative analysis

Data were analyzed after focus groups and debriefing sessions completed their tasks. Content analysis was used to extract themes from the focus group findings, which used to both validate and explain the quantitative results from the questionnaire survey.

Results

Quantitative study revealed that 10.1 % of boys and 3.0% of girls smoked on a regular basis (Table. 1), while 15.3% of boys and 12.4% of girls had tried cigarettes (Table. 2). Almost two fifths of adolescents live in a household with at least one regular smoker. More than half of the students reported their parents, siblings or best friends were smokers (Table. 2).

65.7 % of smokers said their family were not aware of their smoking and 17.4% were aware of their habit (open smokers). Interestingly, a slightly higher proportion of females reported their parents were unaware compared to the males (58.0% and 46.9 % respectively). Parents who were aware of their children's smoking had different attitudes according to gender of their children; 22.2% agreed with daughter's smoking while the corresponding figures for sons were 50.0%. Majority of regular smokers usually bought cigarettes from shops (Table. 2).

Table 2. Smoking behavior among adolescents

Variables	Males (n=1082)	Females (n=1118)	P value
	No (%)	No (%)	
Smoking behavior			
Regular smokers	110 (10.1)	30 (2.8)	P<0.001
Occasional smokers	2(0.2)	2(0.2)	
Had ever tried one	166(15.3)	140(12.4)	
Ex- smokers	89(8.2)	31(2.8)	
Never smoked	715(66.2)	915(81.8)	
Usual sources of obtaining cigarettes			
Bought myself	97(75.2)	22(52.4)	0.05
Friends	23(20.5)	3(9.4)	0.1
Parents	2(1.8)	4(12.5)	0.07
Siblings	3(2.7)	3(9.4)	0.05

Table 3 displays adolescents who lived with smoking fathers smoked almost twice as those who did not. The odds were four times higher for those whose mothers smoked. Those who had a brother who smoked were more than twice and those had a sister who smoked were more than six times more likely to smoke. Adolescents whose friends smoked were more than eleven times more likely to be smokers than those who did not. Having a smoking mother increases the risk of becoming a smoker but a mother's smoking had a stronger effect on girls (30%) than boys (11.1%) while father's

smoking had a stronger effect on boys (13.3%) than girls (5.5%).

Two fifths (38%) of adolescents had ever been offered cigarettes, with boys more likely (43%) than girls (39%). Adolescents who had ever been offered cigarettes did not have the same reactions. Those who refused the offered cigarettes were more than two times more likely to smoke compared to those who were not offered. While, those who accepted the offered cigarettes were nineteen times more likely to smoke compared to those who were not offered.

As described earlier, in the second phase of the study, forty adolescents of the sample

Table 3. Number of non/smoker, Crude/adjusted OR (95% CI) in relation to social environment

Variables	Smokers (n=144)	Non smokers (n=2056)	Crude	Adjusted
	No (%)	No (%)	OR (95% CI)	OR (95% CI) *
Father smoked				
No	83 (57.6)	1451 (70.8)	1	1
Yes	61 (42.4)	599 (29.2)	1.78(1.26,2.51)	1.99(1.40,2.84)
Mother smoked				
No	133 (92.4)	2013(98.2)	1	1
Yes	11(7.6)	37(1,8)	4.08(2.00,8.34)	4.50(2.24,9.02)
Brother smoked				
No	124(86.1)	1922(93.6)	1	1
Yes	20(13.9)	128(6.4)	2.64(1.53,4.54)	2.42(1.46,4.01)
Sister smoked				
No	138(95.8)	2039(99.5)	1	1
Yes	6(4.2)	11(0.5)	6.86(2.41,19.51)	8.06(2.94,22.12)
Peers smoking				
Not smoking	63(43.8)	1742(84.7)	1	1
Up to 50% smoking	36(25.0)	200 (9.7)	4.98(3.22,7.69)	4.61(2.95,7.22)
More than 50% smoking	45(31.2)	113(5.6)	11.01(7.18,16.88)	10.11(6.49,15.74)
Smoking in the family				
No one	64(44.4)	1295(63.0)	1	1
One smoker	57(39.6)	659 (32.1)	1.57(1.21,2.53)	1.92(1.31,2.82)
At least two	23(16.0)	102(4.9)	4.56(2.72,7.65)	5.12(3.00,8.73)

*: Adjusted for age, gender, father education, mother income

1: Reference group

Table 4. Focus groups: Composition of gender and smoking behavior

Group 1	<ul style="list-style-type: none"> • Smokers • 6 males; all regular smokers
Group 2	<ul style="list-style-type: none"> • Smokers and non smokers • 6 males; 1 never smoked, 3 tried once, 2 occasional or regular smokers
Group 3	<ul style="list-style-type: none"> • Smokers and non smokers • 6 males; 4 tried once, 2 occasional or regular smokers
Group 4	<ul style="list-style-type: none"> • Smokers and non smokers • 4 males; 1 never smoked, 1 tried once, 1 ex-smoker, 1 regular smoker
Group 5	<ul style="list-style-type: none"> • All non smokers • 6 females; 3 never smoked, 2 tried once, 1 ex-smoker
Group 6	<ul style="list-style-type: none"> • All non smokers • 6 females; never smoked
Group 7	<ul style="list-style-type: none"> • Smokers and non smokers • 6 females; 3 never smoked, 1 tried once, 1 ex-smoker, 1 regular smoker
Total	<ul style="list-style-type: none"> • 40 participants; 22 males, 18 females • 14 never smoked, 11 tried once, 3 ex-smokers, 2 occasional, 10 regular smokers

took part in focus groups. Composition of gender and smoking behavior in each focus group is detailed in Table 4.

The qualitative research revealed 5 themes in the experiences of adolescent smoking: low prices and easy access to cigarettes; perceived positive effects of smoking; poor social skills; role of family on adolescent supervision; poor legislation on tobacco control, and poor sport facilities

Findings of qualitative study revealed that low prices of cigarettes have played a significant role in reinforcing smoking behavior and do stimulate cigarette consumption which confirmed by a majority of participants. "When someone has easy access to cheap cigarettes he is less likely to quit smoking" (male smoker).

Perceived positive effects of smoking was another common theme raised by the focus groups. Smoking has been considered as a social tool: "giving cigarettes at any social interaction is a sign of respect and friendliness" (male, occasional smoker) "I experiment with and use tobacco because it can serve a constructive purpose in my lives"(a male smoker). "Smoking gives me something in common with other people in social situations" (a male smoker).

Smoking also regarded as a response to stress: "I smoke because it helps me deal with conflict and stress" (a male smoker)." I fell that smoking is a useful response to fati-

gue or coping with the pressure of everyday life" (a female occasional smoker).

Some participants highlighted friends' smoking as an influencing factor on smoking behavior and having more close friends who smoke could lead to cigarette smoking. "I made this habit because so many friends have been asking" (a male smoker); "When you are a teenager, you generally do what your friends are done" (a male occasional smoker); "We smoke because we want to fit-in with our peers" (a male smoker); "When I was not invited to party because I didn't smoke, I started to smoke to maintain my friendships and to gain peer approval" (a male occasional smoker); "I started smoking just to show others my maturity and desire to be a part of their circle of friends. I have to do it... even though I do not enjoy it that much" (a male smoker).

On the other hand, non-smoking friends has also been mentioned as a reason for not smoking by non-smoker groups. "...none of my friends smoke, so I was never tempted to smoke" (Non-smoker, girl); "...friends around me smoke quite often" or "those who are close to me do not smoke" (a male, ex-smoker); "I do not smoke because you know friends do not let friends to smoke" (Non-smoker, girl). "...it's not so hard for not to smoke when nobody offered you a cigarette" (a male smoker).

Perceived parental supervision was another

er theme emphasized by the discussions. The ways parents raise their children or deal with smoking at home could deter children from this habit.

One female participant exclaimed, "Someone's always telling me to stop; ...my parents always warn me to keep away from smoking and about addiction to cigarettes, but never to my brother". Furthermore, it is also posed that younger age felt more control on not smoking by parents compared to their older siblings. "My parents always warn me you are too young to smoke while they do not say that to my brother".

Limited life pleasures were another theme raised by the groups. Some adolescents had greater life opportunities including more recreational and leisure facilities such as going to sport clubs or music concerts. "We would not have anything else to do, so we smoke" (smoker, male)

A male smoker from a disadvantaged southern locality believed "those who live in northern parts of the city or are more affluent have greater financial resources and various recreational and leisure facilities. In contrast people in the south have limited options for recreation and sports participation". Other male smoker emphasized smoking is an appropriate option for spare time especially for less affluent youth".

In some areas, especially in the southern parts of the city, breaking the smoking ban in public places was not unusual as reported by a male group and in some parts still had no smoking new restrictions for local restaurants. More of the less affluent locations had no smoking areas or no complete bans in public indoor. They believed it was the existence of a policy, not its implementation or the actual enforcement of laws. "There is no smoking restriction on youth access to cigarettes in the community; schools might have identical laws, but they are implemented selectively".

Discussion

Despite the relatively low prevalence of adolescent smoking in Iran, it has started to increase dramatically. Developing the eco-

logical perspective and applying combined methods presented a richer and more comprehensive picture of the complexity and diversity of this behavior in the country.

The findings from this research are consistent with other studies [16-17] that suggested the complex interaction of personal, social and environmental factors in considering adolescent smoking.

This section discusses the main findings and compares them to other studies to find out some in/consistencies in the findings.

Gender differences

This study indicates that smoking prevalence in the males was three times greater than females (Table.2). The replication pattern of previous Iranian works confirmed a higher prevalence of smoking among young men than among women. The findings of the Global Youth Tobacco Survey (GYTS) in the Islamic Republic of Iran in 2003 [18] showed that 19.1% of boys, and 9.4% of girls had smoked cigarettes. Smoking prevalence in 30 Moslem countries is significantly higher among men than women, and the prevalence among women typically was in single figures [19].

The lower rates of young females smoking maybe related to some social and cultural reasons. A body of research takes social norms into account as a contributor to the low female smoking rate; For example, traditional cultural values may tolerate female smoking to a lesser degree [20] or social disapproval as Morrow et al showed in a study among young female urban Vietnamese [21]. Others believe smoking by women is often construed as a vice that undermines the social standing of the family [22]. Women may try to conceal their habit through fear of being ostracized by their community, resulting in an underestimation of smoking prevalence. Alternatively, it was associated with a strong sense of cultural taboo, stigma, and non-acceptance between Bangladeshi and Pakistani females [22]. Amos and Mackay [23] found some societies in the EMRO, commonly believed that smoking was vulgar, improper, and even immoral for fe-

males. Therefore, they concluded that a lower level of female smoking in these countries was more likely to reflect social traditions [23].

Parents' attitudes

The focus group discussions suggested that parents may make inferences about their children's smoking behavior based on their gender and age. Female adolescents blamed their parents about being more rigorous about their smoking compared to their brothers or, warned to not start the smoking. Interestingly, an Iranian quantitative study also found evidence that greater parental supervision of girls in Iranian families might be partly responsible for this gender difference [24]. Another important point here was the females believed that if they started to smoke, parents would stop them forcefully while if their brothers do, parents would manage to persuade them not to smoke. Moreover, parents who had past or current smoking experience discussed general strategies to encourage their children not to smoke.

The main message of qualitative data in this regard was negative attitudes of parents toward smoking which perceived as overwhelmingly negative. The findings were consistent with some quantitative studies that suggested that an inverse association between perceived parental disapproval and adolescent smoking behavior [25], or when parents valued non-smoking [26], or if an adolescent believed that parents would be upset if he or she smoked [27], there would be a tendency to lower levels of adolescent smoking. Conversely, it has been found that if parents were indifferent or tolerant towards smoking, a teenager's likelihood of smoking increased [27-28]. Clearly, there is a need for interventions and strategies to take account of what is known about parental attitudes, supervision, and assistance when dealing with smoking prevention.

Complicity and solidarity with peer smoking

Quantitative data revealed that friends' smoking has an influence on adolescent smoking and having more close friends who smoke, more likely to smoke cigarettes.

It has also identified from focus groups that friends are capable of discouraging as well as encouraging smoking behavior. Evidence supporting this fact is that most smokers or ex-smokers had at least one close friend smoked around them. Therefore, it seems that smoking is a way of bonding with the peer group. This finding was consistent with other Iranian literature which emphasized the peer pressure as a predictive factor on youth smoking [5,28,29]. In the country, evidence obtained in the focus group revealed that some females never smoked because none of their friends smoked or have not been offered a cigarette. These findings suggest strategies for peer education as an opportunity for establishing healthy norms, beliefs and behaviors within peer groups.

Accessibility

This study showed that cigarette was easily accessible to adolescents. The majority of adolescents said they personally had bought cigarettes (See Table. 2). This is a major concern when considering the cheap price cigarettes in general and access to a cheaper brand or sale of single cigarettes to adolescents profoundly influences adolescent smoking. This finding was consistent with other researches, which reported that cigarette availability, or little difficulty in obtaining it would lead to the likelihood of experimentation with tobacco [9].

Choice of leisure activities is very important to adolescents. Qualitative data showed that for adolescents living in low-income situations, smoking is the only option for leisure activities. It is worth mentioning that the retail price of a pack of 20 cigarettes is not high enough in Iran. However, some students with limited pocket money but still was able to buy a single cigarette from retailers without any objections. Therefore, improving legislations in relation to sales is recommended. The importance of cheap price cigarettes and availability of that, ex-

panding life opportunities and free leisure activities needs to be considered and examined thoroughly if the focus is on preventing unhealthy behaviors for adolescents in the country.

Qualitative work also pointed to a very deep and important issue. When adolescents received offers of cigarettes from their peers, they construed that smoking was part of socialization. They thought accepting cigarettes was an important part of communication and acted as an icebreaker especially when offered by the opposite sex. Adolescents also acknowledged the occasions of being offered cigarettes. They differentiated between cigarettes offered by peers and adults. Those offered by an adult were interpreted to show that the adolescent had grown up or matured enough to smoke. These findings were consistent with the study of [30], which found that if adolescents received numerous cigarette offers from peers, not only they might conclude that smoking as an acceptable social activity, but they also gained the impression that sharing and accepting cigarettes was an important part of the social exchange process, and that social interactions had to involve cigarettes. These findings have important implications for interventions that refusal skills should be improved in young people and approaches that foster resilience should be available throughout stages of development.

No legislation on tobacco control

Smoking restrictions exist as a policy in the country but as focus group revealed that its legislation to indoor public spaces is insufficient to protect the youth from exposure to tobacco smoke. Outdoor bans may discourage smoking behavior by making it more difficult for smokers to find a place to smoke or by preventing youth from associating smoking with outdoor activities.

Overall, it appears to promote healthy development and encourage wise and responsible decisions regarding smoking by young people reducing or eliminating risk factors and enhancing conditions that can protect and support youth should be considered.

Therefore, this ecological perspective has implications to both explain health behavior and design related health promotion interventions. This approach may provide the program planners with a perspective that recommends design multiple intervention strategies and the need for multi-sectoral preventative actions to effectively address adolescent smoking.

This study shares with others the limitations inherent to cross-sectional data. Because of a lack of time sequence, the relations reported here, should not be interpreted as causal. Further work should be undertaken to explore what and why certain risk factors could influence some young people to smoke.

Conclusion

Cigarettes are easily available to adolescents in Iran. This is likely to encourage experimentation and the subsequent development of regular smoking and addiction. The majority of children who smoke obtain cigarettes illegally. At present little emphasis is given to enforcement of the existing legislation. While improvement of the law pertaining to illegal sales is supported, active enforcement of these laws is essential, along with a commitment to finance and support the agencies necessary to achieve this. According to this ecological approach, prevention of youth smoking requires a comprehensive, multi-dimensional approach, reducing risk factors and promoting protective factors.

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References

1. Edward R ABC of smoking cessation: The problem of tobacco smoking. *BMJ* 2004; 32 (8): 217-219.
2. Jha P, Ranson, M K, Nguyen, N, Yach D. Es-

timates of Global and Regional Smoking Prevalence in 1995, by Age and Sex, *American Journal of Public Health* 2002;92 (6):1002-1006 .

3. Kelishadi R, Mokhtari MR, Tavasoli A A, Khosravi A, Ahangar-Nazari I, Sabet N, Kazemi A, Amiri A. Determinants of tobacco use among youths in Isfahan, Iran. *International Journal of Public Health* 2007; 52 (3):173-179.

4. Kelishadi R, Shady G, Zadeegan NZ, Hashemi-pour M, Sabet-Bashardoust N, Ansari R, Alikhassy H. Smoking, Adolescents and Health: Isfahan Healthy Heart Programme-Heart Health Promotion from Childhood. *Asia Pacific Journal of Public Health* 2004;16(1):15-22.

5. Ayatollahi SA, Mohammad Poor Asl AS, Rajaeefard A. Psychological predictors of transition in different stages of cigarette smoking. *Journal of Ardabil University of Medical Sciences* 2005; 4(14):13-19.

6. Emami H, Habibian S, Salehi P, Azizi F. Pattern of smoking habit in an urban area in Tehran. *Glucose and Lipid study. Journal of Shaheed Beheshti University* 2001; 27:47-52 (Persian).

7. Marmot M, Wilkinson R. *Social Determinants of Health*. 2nd ed. Oxford University Press; 2006.

8. Egan M, Tannahill C, Petticrew M, Thomas S. Psychosocial risk factors in home and community settings and their associations with population health and health inequalities: A systematic meta-review. *BMC Public Health* 2008; 8:239.

9. Unger JB, Yan L, Shkib S. Peer influences and access to cigarettes as correlates of adolescent smoking: a cross-cultural comparison of Wuhan, China and California. *Prevention Medicine* 2002; 34:476-84.

10. U.S. Department of Health and Human Services. Preventing tobacco use among young people: A report of the Surgeon General. Atlanta, Georgia, Washington DC. 1994, US Government Printing Office.

11. Albers AB, Biener L, Siegel M, Cheng DM, Rigotti N. Household Smoking Bans and Adolescent Anti smoking Attitudes and Smoking Initiation: Finding From a Longitudinal Study of a Massachusetts Youth Cohort. *American Journal of Public Health* 2008; 98 (10):1886-1893.

12. Tobacco free initiative (TFI). Updated status of the WHO Framework Convention on Tobacco Control, website <http://www.who.int/tobacco/framework/countrylist/en/index.html>, accessed 23 January 2008).

13. Iranian Ministry of Health and Medical Education. No Smoking Day Seminar, 29 May, 2003. Tehran, Ministry of Health and Medical Education (Persian).

14. Smoking, drinking and drug use among young people in England, 2004; 2002 [Fuller, 2004; Boreham, and Mc Manus, 2003].

15. Priest H, Robert P, Woods L. An overview of three different approaches to the interpretation of qualitative data. *Nurse researcher* 2002, 10:30-43.

16. Niknami Sh, Akbari M, Ahmadi F, G. Ba-

baee-Rouchi G, Heidarnia A. Smoking initiation among Iranian adolescents: a qualitative study. *Eastern Mediterranean health journal* 2008; 14 (6): 1290-300.

17. Hoyt A. Delivering primary substance abuse prevention in primary care. *Clinical excellence for nurse practitioners* 2002, 6(3):31-7.

18. Global Youth Tobacco Survey (GYTS). Islamic Republic of Iran, fact sheet. Atlanta, Georgia, Centers for Disease Control, 2003.

19. Ghouri N, Atcha M, and Sheikh A. Influence of Islam on smoking among Muslims. *BMJ* 2006; 332(7536): 291-294.

20. Zhang, L., Wang, W., Zhao, Q., and Vartiainen, E. Psychosocial predictors of smoking among secondary school students in Henan, China, *Health Education Research Theory and Practice* 2000; 15 (4): 415-422.

21. Morrow RH. Macroeconomics and health, *British Medical Journal* 2002; 352: 53-4.

22. Bush, J., White, M., Kai, J., Rankin, J., and Bhopal, R. Understanding influences on smoking in Bangladeshi and Pakistani adults: community based, qualitative study, *British Medical Journal* 2003; 326:962-965.

23. Amos A, and Mackay J. Tobacco and women, In *Tobacco science, policy and public health*, Boyle, P. Gray, N. Henning field, J. Seffrin, J., Zatonski, W. (eds.) Oxford, New York, 2004.

24. Ahmadi J and Ghanizadeh A. Current substance use among Iranian medical students, *Indian Journal of Psychiatry*. 2001; 43(2) 157-161.

25. Sargent J D. and Dalton, M. Does parental disapproval of smoking prevent adolescents from becoming established smokers? *Paediatrics* 2001; 108(6):1256-1262.

26. Pierce J.P, Distefan, J.M. and Hill D. Adolescent smoking. In Boyle P, Gray N, Henning field, Seffrin J, Zatonski W, *Tobacco: Science, policy and public health*, Oxford; 2004.

27. Fearnow M, Chassin L and Presson C. Determinants of parental attempts to deter their children's cigarette smoking, *Journal of Applied Developmental Psychology* 1998; 19(3):453-468.

28. Hashemi, N. The prevalence of cigarette smoking in male adolescents at Yasuj University of Medical Sciences, *Armaghan Danesh* 2001; 6 (23):43-47(Persian).

29. Afrasiabi far A, Derakhshani A, Sadeghi-Hassanabadi A, Rajaeefar AR. A survey of cigarette smoking tendency and its associated cause among students. *Shiraz University of Medical Science* 2001; 5(19-20):42-48 (in Persian).

30. Taylor, RD, and Seaton, EK (2002) Psychological adjustment of urban, inner-city ethnic minority adolescents, *Journal of Adolescent Health* 2002; 31(68): 280-87.