

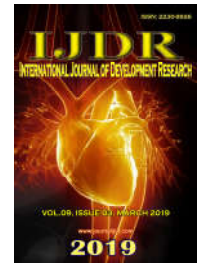


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## RISK FACTORS OF SMOKING AMONG PRIMARY SCHOOL STUDENTS

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### ABSTRACT

**Background:** Tobacco use has become a rapidly growing problem worldwide as well as in many developing countries. Of serious concern, is the increasing trend in smoking prevalence amongst school aged children and the likelihood that many of them who begin to smoke at an early age, will continue to do so throughout adulthood. **Aim:** To examine the impact of different risk factors in the initiation and continuation of smoking among primary school students in Mosul city. **Materials and Methods:** A case-control study design was adopted, where 200 smoker pupils were allocated as cases and another 200 non-smoker pupils were consider as controls. Study period was from the 1st of September to the 1<sup>st</sup> December 2011. Data collection tool was a questionnaires used to measure current cigarette use, age of initiation of cigarette smoking, current use of other tobacco products, exposure to second hand smoking, tobacco use by family members; in addition a question about student's knowledge acquired from school educational curriculum regarding harmful effect of smoking were present. Odds ratio, Chi square test, t-test and 95% confidence interval were used as statistical analyzing tools. **Results:** Important risk factors have been evaluated in this study to play a role in development of smoking among primary school students: type a personality, low and middle educational level of father and social class IIIa with variable level of significance. Regarding family members and peer smoking status; smoking father, mother, siblings, grandfather and peer whether in or out of the school appeared to have high influence on students to smoke. Moreover, good family consistency, high school performance, high standard of student's knowledge on the effects of smoking, using car to travel to/from school emerge as protective side. **Conclusion:** Model role of family member in addition to peer pressure manifested its influence clearly in the primary school students to smoke.

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## INTRODUCTION

Tobacco is a major public health problem. It has been officially recognized as a substance use disorder that has epidemiological, etiological, phenomenological, patho-physiological, co-morbid, diagnostic, therapeutic, prognostic and outcome domains. It causes millions of premature deaths and huge economic losses globally every year (Al-Haddad *et al.*, 2003). Despite increasing awareness to the harmful effects of tobacco, the use of tobacco in various forms continues to be a significant health risk factor. It has been predicted by the World Health Organization (WHO) that more than 500 million people alive today will be killed by tobacco use by 2030 and tobacco consumption will become the single leading cause of death (Majra, 2008). Almost 70% of them in developing countries, one-third of which will be children (WHO, 2002). The morbidity and mortality associated with tobacco use is shifting

from the developed world to developing countries, especially low- and middle-income Arab countries (Jha and Chaloupka, 2000). Much of the morbidity and mortality associated with tobacco use, such as cancers, chronic lower respiratory obstructive conditions and cardiovascular morbidity and mortality are experienced after several decades of smoking (Warren *et al.*, 2006). The majority of people who suffer morbidity later in life had initiated smoking as adolescents or young adults (Bourgakard *et al.*, 2008). Most smokers start smoking during their adolescence or early adult years, the earlier they start to smoke, the more likely they are to become regular smokers, along with the increase in the prevalence of smoking, there has been a significant decrease in its age of onset (Kiss *et al.*, 1999). A disproportionate share of the global tobacco burden falls on developing countries, where 84% of 1.3 billion current smokers reside (Jha and Chaloupka, 2001). The WHO has reported widely differing prevalence of smoking among young people in the Arab countries: 23% in

Iraq, 18% in Kuwait, 7% in Oman, 25% in Saudi Arabia and Jordan, 31% in Syria Arab Republic, 43% in Yemen and 53% in Lebanon (MNA, 2001). Adult smokers almost always initiate tobacco use before the age of 18, when they are easily influenced by their parents, peers, social norms, and tobacco advertising. Initiating smoking at an early age also increases the risk of heavier smoking at a later age (Escobedo *et al.*, 1993). Other research has found that the frequency with which youth observe smoking is positively associated with their perceptions of the acceptability of smoking, and that social modeling of smoking by peers at school increases the risk of smoking. This evidence suggests that decreased examples to children of smoking will decrease the risk of children starting smoking (Sheena Hudson and George Thomson, 2011). The process leading to regular smoking generally progresses through five fairly well-defined stages over two to three years irrespective of the age at which smoking first begins. In the preparatory stage, attitudes and beliefs about the utility of smoking are formed. In the trying stage, the individual smokes the first few cigarettes. In the experiment stage, the individual smokes repeatedly but irregularly. In the regular use stage, the individual smokes at least weekly across a variety of situations and personal interactions. Finally the addiction/dependent smoker stage is characterized by a physiological need for nicotine (Giovino *et al.*, 1995). The process rarely begins before age 11—most children smoke their first cigarette between 11 and 15 years of age, although a small proportion wait until their late high school years or later (Conrad *et al.*, 1992). About a third to a half of young people who experiment with cigarettes become regular users (Giovino *et al.*, 1995). Therefore, tobacco research and prevention programs must focus on the early years of life and include education to prevent children and youth from initiating smoking (SAMHSA, 2001). Numerous risk factors for daily smoking have emerged from epidemiological studies often report childhood primary environment; parental low socio-economic status, parental divorce, and childhood adversities (Droomers *et al.*, 2005), have been found to be associated with smoking in childhood and adolescence. Smoking in the social environment, parental smoking, especially a smoking mother, peer smoking, and smoking siblings (Huurre *et al.*, 2003; Fagan *et al.*, 2005). Have been found to predict smoking, although results on the determinants are partly inconsistent. However, the role of stressful childhood experiences and their relation with later determinants of smoking is complex and needs more comprehensive research (Slomkowski *et al.*, 2005). Accordingly, the present study was a trial to examine the impact of different risk factors in the initiation and continuation of smoking among primary school students in Mosul city. Materials and Methods: In order to achieve the aim of the present study, a case-control study design was adopted, and conducted in 10 primary schools randomly selected at the left sector of Mosul city.

#### **200 primary school pupils were enrolled in this study as cases according to the following inclusion criteria**

- The participant must be a primary male pupil.
- The participant must be currently smoker.

#### **Another 200 primary school pupils were chosen as controls with the**

##### **Following inclusion criteria**

- The participant must be a primary male pupil.
- The participant must be non- smoker.

Un-paired sampling technique was used in this study. Every participant in this study was interviewed by the researcher and personal consent was taken before the following questions were answered. The Children's smoking behavior was assessed with the following question, "Have you ever smoked even one puff of a cigarette?" In addition, children were asked if their siblings and friends ever smoked (Norma Olvera *et al.*, 2006). Current parental smoking also was assessed. The standard definition of current smoking was used to assess parental smoking, which requires an individual to smoke at least 100 cigarettes in their lifetime and currently smoke every day or some days (Hassan Ziaaddini *et al.*, 2007). However, this definition was overly stringent for use with our primarily preadolescent sample. Thus, we decided to use a more liberal definition that differentiated between ever- vs. never smokers for the children in this study. For the analysis, children were classified as ever-smokers if they answered "yes" to the question. Demographic data included were questions about the subject's age, education attainment. Smoking attitude scale Questions adapted from the Survey of Youth Smoking Behavior were used to assess general attitudes toward smoking habit and Parenting Dimensions Inventory (PDI) (Norma Olvera *et al.*, 2006). The PDI is a multidimensional instrument consisting of 47 items that assess three domains of parenting: support, structure and control/strictness. Parental support included nurturance, responsiveness to child input, and reasoning subscales. Chi-square test was used to look for the presence or absence of an association. Odd ratio (OR) with its 95% confidence interval (95% CI) were also computed. P-value less than or equal to 0.05 was considered significant.

## **RESULTS**

Description of cases population Figure 1 shows distribution of cases according to number of cigarettes smoked per day, where 42% of cases smoked 11-20 cigarettes per day. Figure 2 demonstrates distribution of cases according to the source of the first cigarettes smoked 61% of cases smoked their first cigarettes that given to them by other, 18.5% bought the cigarettes, 9.5% found cigarettes, while 11% did not remember the source.

**Analysis of risk factors:** Table 1 demonstrates a highly significant effect of type A personality ( $P=0.000$ ) as a risk factor in the development of smoking than type B. Table 2 indicates that there is a highly significant difference between cases and controls regarding the educational level of father and the risky association decline from low level to high educational level where this level played a protective role against the development of smoking (OR= 2.11), (OR=1.68), (OR=0.08) respectively. Table 3 shows that mothers with high educational level played a significant protective role against development of smoking (OR= 0.13,  $P=0.000$ ). Table 4 demonstrates the association between social class and the development of smoking. Social class I and II operated as a significant protective factor against the development of smoking (OR=0.18,  $P=0.000$ ), (OR=0.33,  $P=0.002$ ), in contrast to class IIIa which prone to development of smoking in a just significant manner (OR=2.52,  $P=0.028$ ). Apart from smoking grandmother, there are strong differences between cases and controls in all smokers family members that involved in this study and run in significant risky association; i.e. smoker father (OR=6.49,  $P=0.000$ ), smoker mother (OR=5.76,  $P=0.011$ ), smoker sibling (OR=2.59,  $P=0.000$ ), smoker grandfather (OR= 2.59,  $P=0.012$ ).

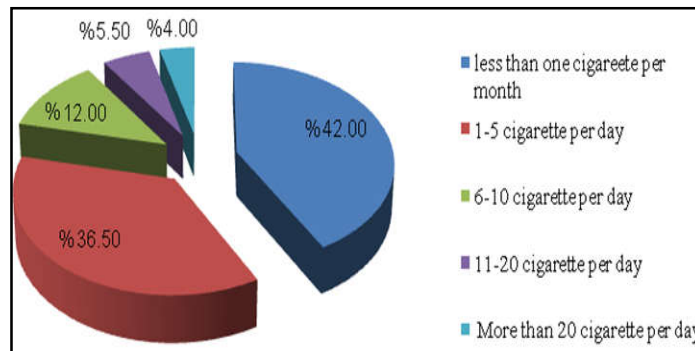


Figure 1. Distribution of cases population according to number of cigarettes smoked

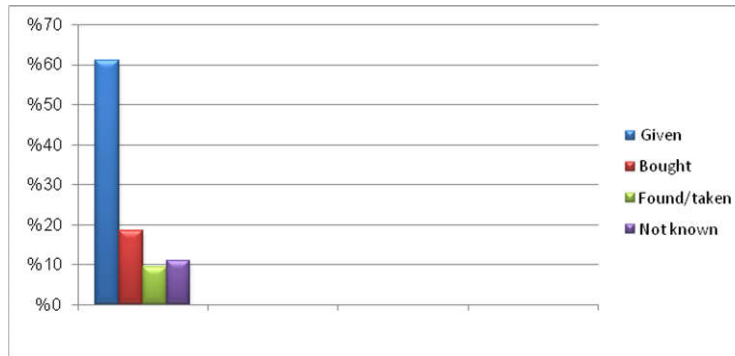


Figure 2. Distribution of cases population according to the source of first cigarettes

Table 1. Association of the personality's type and the development of smoking

Type of personality	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
Type A	121(60.5%)	66(33.0%)	3.11	0.000	2.07-4.68
Type B	79(39.5%)	134(67.0%)			

\*Chi-square test was used

Table 2. Association of educational level of father and the development of smoking

Educational level of father	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
low	119(59.5%)	82(41.0%)	2.11	0.000	1.42-3.15
middle	73(36.5%)	51(25.5%)	1.68	0.017	1.09-2.58
high	8(4.0%)	67(33.5%)	0.08	0.000	0.04-0.18

\*Chi-square test was used

Table 3. Association of mothers' educational level and the development of smoking

Educational level of mother	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
low	93(46.5%)	78(39.0%)	1.36	0.130	0.91-2.02
middle	101(50.5%)	84(42.0%)	1.41	0.088	0.95-2.09
high	6(3.0%)	38(19.0%)	0.13	0.000	0.05-0.32

\*Chi-square test was used

Table 4. Association of social classification and the development of smoking

Social classification	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
I	6(3.0%)	29(14.5%)	0.18	0.000	0.07-0.45
II	11(5.5%)	30(15.0%)	0.33	0.002	0.16-0.68
IIIa	19(9.5%)	8(4.0%)	2.52	0.028	1.08-5.90
IIIb	64(32.0%)	51(25.5%)	1.37	0.151	0.89-2.12
IV	42(21.0%)	38(19.0%)	1.13	0.617	0.69-1.85
V	58(29.0%)	44(22.0%)	1.45	0.108	0.92-2.28

\*Chi-square test was used

Table 5. Association of family member's smoking status and development of smoking

Family member's smoking status	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
Smoker father	128(64%)	43(21.5%)	6.49	0.000	4.16-10.12
Smoker mother	11(5.5%)	2(1.0%)	5.76	0.011	1.26-26.34
Smoker sibling	71(34.5%)	35(17.5%)	2.59	0.000	1.63-4.13
Smoker grandfather	24(12%)	10(5.0%)	2.59	0.012	1.20-5.57
Smoker grandmother	3(1.5%)	1(0.5%)	3.03	0.315	0.31-29.38

\*Chi-square test was used.

**Table 6. Association of other family factors and the development of smoking**

Relationship between other family factors with student's smoking status	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
Good Maternal communication	116(58.0%)	146(73%)	0.51	0.002	0.34-0.78
Good Paternal communication	82(41.0%)	115(57.5%)	0.51	0.001	0.35-0.76
Good Maternal supervision	54(27%)	102(51%)	0.36	0.000	0.23-0.54
Good Paternal supervision	39(19.5%)	84(42%)	0.33	0.000	0.21-0.52

\*Chi-square test was used

**Table 7. Association of non-family factors and development of smoking**

Non-family factors	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
High school performance	49(24.5%)	118(59.%)	0.23	0.000	0.15-0.35
High student's knowledge on the effects of smoking	151(75.5%)	169(84.5%)	0.57	0.024	0.34-0.93
Advertisement	63(31.5%)	21(10.5%)	3.92	0.000	2.28-6.74

\*Chi-square test was used

**Table 8. Association of school friends' smoking status and the development of smoking**

School friends	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
Most/Some friends smoke	132(66.0%)	31(15.5%)	10.58	0.000	6.54-17.14
None smoker	61(30.5%)	115(57.5%)	0.32	0.000	0.22- 0.49
Unknown	7(3.5%)	54(27.0%)	0.10	0.000	0.04- 0.22

\*Chi-square test was used

**Table 9. Effects of smokers' friends outside school on the development of smoking**

School friends	Smoker No. (%)	Non-smoker No. (%)	OR	P-value*	95% C.I
Most/Some friends smoke	91(45.5%)	28(14.0%)	5.13	0.000	3.15-8.34
None smoker	88(44.0%)	105(52.5%)	0.71	0.089	0.48-1.05
Unknown	21(10.5%)	67(33.5%)	0.23	0.000	0.14-0.40

\*Chi-square test was used.

Table 6 illustrates the relationship between other family factors with student's smoking status. It asserts that good maternal and paternal communication and supervision protect the students from developing smoking; this association appears in highly significant way. Table 7 demonstrates the association of non-family factors and the development of smoking among study population. High school performance was found to be significantly protective against the development of smoking (OR=0.23, P=0.000). Moreover, this table also shows high students' knowledge about the effects of smoking, appear to be protected against the development of smoking (OR=0.57) in a just significant way (P=0.024). The role of advertisement in the development of smoking has been simplified in this table, which seems to be highly significant (P=0.000) with an additional risk in cases in comparison to controls (OR=3.92). Table 8 portrays the effects of school friends and the development of smoking. It clarifies that there is about ten times significant risk (P=0.000) to be smoker if most/some friends are smokers, while non-smoker friends and friends with unknown smoking status played a significant protective role (P=0.000). Table (MNA, 2001) indicates that there is a highly significant difference between cases and controls regarding smoker friends outside school (P=0.000) which results in excess risk for development of smoking (OR=5.13).

## DISCUSSION

Cigarette smoking continues to be a threat to global health. The number of cigarettes smoked per person tends to increase each year, and the age of starting seems to be dropping. The research related to cigarette smoking conducted among young people generally studied high school or university students. However, studies have shown that students usually start smoking during the primary school period out of curiosity or imitation (Madan Kumar *et al.*, 2006). This study attempted to find out the important risk factors that associated with the development of smoking among primary school pupils.

Theories on smoking and drug use contend that persons may be unable to resist temptations to smoke if they are unable to control certain other behaviors, including tendencies to be impulsive, easily distracted, or aggressive or to exhibit type A behavior (Uncu *et al.*, 2006). Studies have shown that smoking was more common among (Al-Haddad *et al.*, 2003) adolescents who reported getting into trouble at school; (Majra, 2008) young adults who had been aggressive, quarrelsome, and impatient at age 8 years; (WHO, 2002) young adults who as children did not solve problems reasonably, did not negotiate with others, and were not conciliatory toward others (Forgays *et al.*, 1993). In this study students with type a personality were 3 times more prone to smoke. Parental education had a strong gradient in daily smoking and affected it through different paths. First, lower parental education increased the risk of childhood adversities and parental smoking. The effect of parental education was also mediated through the respondent's own education, which was strongly associated with daily smoking (Laura Kestilä *et al.*, 2006). High educational level of father and mother in this work operate as protective factor against the development of smoking in the contrary of middle and the low one, this results are similar to that of two national surveys which consistently showed that education is inversely related to cigarette smoking (Fagan *et al.*, 2005; Vardavas *et al.*, 2007). Other studies reported non-significant effects of parental education on smoking only maternal education (26, 27). With our findings, the likelihood of students to be smokers increases in middle social class (p=0.028), which may be a manifestation of low family education and less family supervision. Similar relationship between smoking prevalence and socioeconomic status has been reported (Peter *et al.*, 1997; Milton *et al.*, 2004). Parental smoking behaviors have been found to play a key role not only in students' initiation but also in the escalation of their smoking habits (Rashid Ahmed *et al.*, 200). Some studies indicate that students having at least one smoking parent are more likely to begin smoking themselves

(Bourgard *et al.*, 2008). Others have suggested that children with at least one smoking parent are significantly more likely to progress to higher levels of smoking, compared to children whose parents do not smoke (Leatherdale *et al.*, 2005). The current results showed that 64% of smoker students have smoker fathers, only 5.5% have smoker mothers and 12% have smoker grandfather ( $P=0.000$ ,  $P=0.011$  and  $P=0.012$ ) in that order, which close to findings of some studies (Norbanee *et al.*, 2006; Hrubá and Zaloudíková, 2008). Presumably, because cigarettes are readily available at home and possibly because parents model smoking behavior and lack credibility as advocates of nonsmoking. The sibling effects on students may be a reflection of parents smoking and present with 34.5% of smoker students versus 17.5% of non-smoker ( $OR=2.59$  and  $P=0.000$ ).

In one study reported that smoking among older siblings had little or no influence on smoking among their younger sisters and brothers (Shamsuddin and Abdul Haris, 2000), but other evidence suggested that young siblings are influenced by sibling smoking (Milton *et al.*, 2004; Chassin *et al.*, 1984). Some studies found that strictness and hostility of parents toward their children increased the risk for smoking initiation among adolescent boys (Epstein *et al.*, 2007). However, other study concluded that perception of parental strictness by adolescent children did not contribute to smoking initiation (Radziszewska *et al.*, 1996). Good paternal and maternal communication and supervision in this study appear to have highly significant association with the smoking among primary school students. Also results of some studies suggested that close supervision deters the smoking among adolescents (Jackson *et al.*, 1997; Jackson *et al.*, 1994). One study revealed that authoritative parenting styles influenced children's smoking initiation independently of parental smoking status (Cohen *et al.*, 1994). Parental involvement implies the active participation of parents in their children's lives. A longitudinal study of fifth and seventh graders found lower rates of smoking initiation among children who reported that their parents spent more time with them and communicated with them more frequently (Krohn *et al.*, 1986). In one study, parental involvement in their children's school, religious, and athletic activities decreased the risk for smoking among both girls and boys (Stanton *et al.*, 1995).

In another study, children who perceived their parents as generally unconcerned about their social activities were slightly more likely to increase their smoking over a one-year period (Pierce *et al.*, 1991). Moreover, while assessing the school performance and high knowledge about smoking's effects as factors related to smoking behavior, it found that 24.5% and 75.5% of smoker students have high school performance and knowledge, the results which set these factors as protective. Similarly, in their analysis of data from the 1990 California Youth Tobacco Survey, Hu and colleagues found that students who reported their performance in school as below average were more likely than better-than-average students to be current or former smokers (Ford *et al.*, 1995). The role of advertisement, in this work was obvious with a risk reach about four fold difference between smokers and non-smokers ( $P=0.000$ ), which is constant with a result of a national survey of cigarette smoking in fourth-form school children in New Zealand (Lovato, 2004). Peer influences to smoke may be direct or indirect (Milton *et al.*, 2004). Direct peer pressure may occur in the form of encouragement, dares, or actual offers of the substances. Indirect peer influences can

occur when youth associate with peers who smoke, increasing the availability of these substances, providing role models, establishing substance use as normative, and creating the perception that using these substances might increase social acceptance. Researchers have typically found a strong association between participants' smoking status and the close friends' smoking status (Jackson *et al.*, 1997; Allen *et al.*, 2003). This association manifested correspondingly with a risk of (10.58) regarding the difference between smoker and non-smoker students inside school and (5.13) outside it.

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