RESEARCH ARTICLE

Smoking Stage Relations to Peer, School and Parental Factors among Secondary School Students in Kinta, Perak

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Abstract

Background: To identify the prevalence of different stages of smoking and differences in associated risk factors. Materials and Methods: Thos longitudinal study started in February 2011 and the subjects were 2552 form one students aged between twelve to thirteen years of from 15 government secondary schools of Kinta, Perak. Data on demographic, parental, school and peer factors were collected using a self-administered questionnaire. We examined the effects of peer, school and parental factors on the five stages of smoking; never smokers, susceptible never smokers, experimenters, current smokers and ex-smokers, at baseline. Results: In the sample, 19.3% were susceptible never smokers, 5.5% were current smokers 6% were experimenters and 3.1% were ex-smokers. Gender, ethnicity, best friends' smoking status, high peer pressure, higher number of relatives who smoked and parental monitoring were found to be associated with smoking stages. Presence of parent-teen conflict was only associated with susceptible never smokers and experimenters whereas absence of home discussion on smoking hazards was associated with susceptible never smokers and current smokers. Conclusions: We identified variations in the factors associated with the different stages of smoking. Our results highlight that anti-smoking strategies should be tailored according to the different smoking stages.

Keywords: Smoking stages - adolescent - peer factors - parental factors - school factors

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Introduction

Over the past few decades cancer has become the leading cause of death across many Asian countries (Chassin et al., 1990). Different countries utilize different systems or strategies to manage this growing problem (Mahari, 2011). Tobacco use is highly associated with lung cancer and more than half of this malignant disease is said to be caused by tobacco smoking (Kaplan et al., 2001). Although tobacco use is one of the biggest threats to public health (Gritz et al., 2003), lack of case control and cohort studies in Asia and the complex relationship between cancer and tobacco use makes it difficult to derive conclusions (Kaplan et al., 2001).

Tobacco use is one of the most modifiable causes of not only cancer but also other diseases in Malaysia (Conrad et al., 1992). Annually, in Malaysia, nearly 10000 deaths are said to be related to smoking and the government spends about USD 1 billion to treat smokers for various smoking related diseases (Thornton et al., 1999). It is not surprising that anti-smoking campaign is one of the important strategies of the National Cancer Control Program.

Most adult smokers became tobacco users from the time they were only an adolescent (Mosavi-Jarrahi et al., 2004; Seo et al., 2008). Among adolescents, smoking can be conceptualized as a multi-stage process occurring over time (Kaplan et al., 2008) or as progressing through a sequence of developmental stages characterized by differences in smoking frequency and intensity (Pierce et al., 2005).

Although many studies related to tobacco use have been conducted in Malaysia, we still lack information on smoking stages among adolescents in Malaysia, the factors associated with the different stages and predictors of smoking progression from one stage to another. It is important to identify factors associated with the different stages of smoking so that preventive measures can be tailored accordingly. This paper discusses the prevalence of different smoking stages and its association with peer, school and parental factors.

Materials and Methods

Study design and selection of participants

Perak is the second largest state in Peninsular Malaysia. This study was conducted in Kinta, the largest district of Perak. Schools in Kinta were classified as urban or rural schools according to Malaysian Ministry of Education's criteria. Schools within a city or town municipality are considered as urban schools and the others are categorized

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as rural schools (Mohammadpoor et al., 2007). Probability sampling method was used to select the schools. A longitudinal study aiming to identify factors influencing the transition of smoking stages among adolescent was started in February 2011. This paper is from the first phase of this study and presents results from the data collected from students aged between twelve to thirteen years old from fifteen government secondary schools.

Study instrument

A self-administered questionnaire was developed based on review of instruments used in previous tobacco studies. The questionnaire was used to classify participants into different stages of smoking and also to identify familial, individual and socio environment factors influencing the participants smoking habits. Content, face validity and results from both test retest and internal consistency showed the instrument to be valid, stable and consistent over time. Students completed the questionnaire during school hours. Prior to distribution of the instrument, the students were assured that their responses will be kept confidential and had no bearings on their school academic and discipline performance. The questionnaire consisted of ninety six items which included questions for the dependent variables, socio-demographic characteristics and the following independent variables.

Dependent variables

Smoking status was assessed through students' response to one item asking, "Have you ever smoked a cigarette, even one or two puffs?" Students who responded "Yes" were classified as 'ever smokers'(NHMS III, 2006) and those who answered "No" as 'non-smokers.' Non-smokers were further dived as either never smokers or susceptible never smokers (Michell et al., 1996). As the participants of this study were only twelve to thirteen year olds, the number of cigarettes smoked was not used to define any of the stages.

Definitions

Never smoker: Never tried a cigarette, not even a few puffs and those who answered "Definitely no" to all three susceptibility questions.

Susceptible never smokers: Never tried a cigarette, not even a few puffs and those who answered anything other than "Definitely no" to any one of
the three susceptibility questions.

Experimenter: Those who reported having smoked but did not smoke in the past 30 days.

Current smoker: Those who smoke currently regardless of frequency and number of cigarettes smoked.

Ex-smoker: Those who reported to have quit smoking.

Predictor variables

The independent variables were categorized into four main domains (socio-demographic, family, school and peer). The demographic domain contained ten items. Five items gathered information on participants' age, gender, race, religion, and whom they were living with. The remaining five items collected information regarding the participants' parents' occupation, education and marital status. The question on parents' occupation was an open ended question and the answers were classified according to Malaysia Standard Classification of Occupations 2008 (MASCO-08).

The items in the second domain were on peer factors and explored best friends' smoking habits and the existence of peer pressure to smoking. The two school factors included in this study were school connectedness and school adjustment (how the students adjust to the school work). Family and parenting factors were in the fourth domain. This domain consisted of subscale measuring family members smoking influences (parents smoking, siblings smoking and number of family members who smoke), parental monitoring, parents expectations, home ban on smoking, home discussions on smoking and whether there were any parent-teen conflicts.

Ethical clearance

Ethical approval was obtained from University Malaya, Malaysian Ministry of Education and Perak State Education Department. Permission was also gained from all the school heads.

Statistical analyses

SPSS software version 15.0 was used to enter and analyze the data. The procedures in complex samples add-on module in SPSS were used in the analyses after adding appropriate student and school weights that were adjusted for non-response. The predictors of smoking stages, whether ever smokers, susceptible never smokers, experimenters or current smokers, were tested using multinomial logistic regression analysis. All variables that were significant at 0.25 or lesser in the univariate analyses were included in the multivariate analysis. Independent variables were removed manually starting with the variable with the highest insignificant p value. Reference category was the never smoking stage. Strength of association between the selected variable and the smoking stages was assessed using adjusted odds ratio and 95% confidence interval.

Results

The response rate in our study was 90.7% and there were 2552 participants in the sample out of which 46.8% were Malays, 33.5% were Chinese and 17.1% were Indians. In the sample there were 2143 non-smokers and 409 ever smokers. The prevalence of susceptible never smoker was 19.3%% (95%CI: 17.7%, 21.2%). The prevalence of current smoking among the adolescents was 5.5% (95%CI: 4.7%, 6.6%) and experimentation was 6% (95%CI: 5.1%, 7.1%). Also, 3.1% (95%CI: 2.4%, 3.9%) admitted to be ex-smokers.

In the sample, majority (77.3%) of the participants were from urban schools. The male participants were predominant in all the stages except for the never smoker stage where the female participants' were the majority, 55.6%.

A comparison between urban and rural schools showed that the urban schools had more experimenters, current smokers and also ex-smokers. Importantly more than

60% of the current smokers reported high peer pressure to smoke. In our study more than 50% of the experimenters and current smokers had at least one parent who smoked. Siblings' smoking was also high among the experimenters and current smokers.

Tables 1 and 2 show the results from univariate analyses testing the effect of the independent variables on smoking stages. All variables except for parents' marital

Table 1. Socio-demographic and Peer Factors Association with Smoking Stages in Kinta, Perak (2011)

Demographic factors		Smoking status					p value
		Never smoker n (%)	Susceptible Never Smoker n (%)	Experimenter n (%)	Current Smoker n (%)	Ex-smoker n (%)	
Gender	Female	933 (55.6)	151 (30.7)	32 (16.4)	21 (12.7)	13 (16.8)	< 0.001
	Male	735 (44.4)	323 (69.3)	136 (83.6)	137 (87.3)	70 (83.2)	
Area of School	Urban	861 (77.8)	261 (80.2)	73 (71.4)	65 (69.5)	37 (72.5)	0.004
	Rural	808 (22.2)	213 (19.8)	95 (28.6)	93 (30.5)	46 (27.5)	
Race	Malay	720 (42.0)	229 (48.0)	122 (73.0)	102 (60.0)	60 (67.6)	
	Chinese	615 (36.5)	168 (36.2)	25 (10.3)	34 (23.0)	12 (16.4)	<0.001
	Indians	295 (19.2)	61 (13.2)	20 (15.7)	12 (10.8)	9 (12.1)	
	Others	39 (2.4)	16 (2.6)	1 (1.0)	10 (6.3)	2 (3.9)	
Parents' Marital Status	Married	1518 (90.3)	432 (90.5)	149 (85.5)	135 (86.1)	74 (86.9)	0.299
	Single parents	14 (9.7)	40 (9.5)	17 (14.5)	21 (13.9)	8 (13.1)	
Father's education level	Primary & No formal education	317 (17.9)	109 (21.5)	23 (11.1)	25 (15.5)	13 (18.6)	
	Secondary level	805 (49.9)	201 (41.2)	72 (41.5)	72 (40.3)	38 (44.7)	< 0.001
	Tertiary level	170 (10.0)	38 (8.8)	17 (9.9)	`14 (6.0)	15 (11.7)	
	Do not know	375 (22.2)	123 (28.5)	56 (37.5)	47 (38.2)	17 (25.0)	
Mother's education level	Primary & No formal education	293 (17.5)	122 (24.1)	26 (12.7)	25 (17.1)	7 (10.8)	
	Secondary level	883 (54.1)	192 (39.2)	80 (45.8)	67 (33.9)	49 (54.2)	< 0.001
	Tertiary level	158 (9.0)	39 (9.3)	14 (9.6)	17 (9.2)	10 (11.3)	
	Do not know	335 (19.5)	121 (27.4)	48 (31.9)	49 (39.8)	17 (23.7)	
Father's occupation	Manager & Professional	165 (10.0)	32 (7.4)	10 (5.1)	15 (8.7)	8 (10.5)	
	Other Professions	1224 (74.3)	337 (69.3)	113 (63.3)	100 (59.0)	57 (67.0)	
	Unemployed	17 (1.1)	11 (3.1)	2 (1.3)	2 (2.1)	1 (0.6)	< 0.001
	Do not know	258 (14.6)	90 (20.2)	42 (30.4)	41 (30.2)	16 (21.9)	
Mother's occupation	Manager & Professional	144 (8.7)	30 (7.3)	11 (7.9)	8 (4.8)	3 (3.2)	
	Other Professions	374 (23.1)	130 (28.6)	35 (22.9)	47 (32.8)	20 (27.1)	< 0.001
	Housewives	977 (59.5)	269 (56.1)	95 (53.5)	76 (41.9)	49 (55.0)	
	Do not know	174 (8.7)	45 (8.0)	27 (15.8)	27 (20.5)	11 (14.8)	
Best friend smoking status	No	1478 (89.8)	324 (68.3)	74 (43.8)	45 (32.5)	29 (36.2)	<0.001
	Yes	180 (10.2)	143 (31.7)	91 (56.2)	110 (67.5)	54 (63.8)	
Peer pressure	Low Peer Pressure	1549 (92.9)	351 (78.0)	83 (50.7)	44 (33.2)	41 (56.8)	<0.001
	High Peer Pressure	119 (7.1)	117 (22.0)	83 (49.3)	111 (66.8)	42 (43.2)	

Table 2. Family and School Factors Association with Smoking Stages in Kinta, Perak (2011)

Demographic factors	Smoking status					p value
	Never smoker	Susceptible Never smoker	Experimenter	Current Smoker	Ex-smoker	
School connectedness	19.0 (18.8,19.2)[a]	17.9 (17.7,18.2)[a]	17.8 (17.2,18.3)[a]	17.5 (16.8,18.1)[a]	18.8 (18.2,19.4)[a]	<0.001
School adjustment	5.71 (5.64, 5.78)[a]	5.20 (5.06, 5.33)[a]	5.21 (4.99, 5.44)[a]	5.21 (4.96, 5.47)[a]	4.99 (4.71, 5.28)[a]	<0.001
Parents smoking status						
Neither parents smoke	807 (47.9)	189 (41.6)	65 (38.4)	43 (26.2)	29 (32.8)	<0.001
At least one parent smoke	738 (44.3)	243 (49.9)	91 (54.6)	104 (66.6)	47 (61.2)	
Ex-smoker	118 (7.8)	38 (8.5)	12 (7.0)	10 (7.2)	5 (6.0)	
Siblings smoking status						
No siblings/none of the siblings smoke	1421 (86.2)	352 (76.1)	96 (61.2)	65 (42.9)	56 (70.5)	<0.001
Yes siblings smoke	188 (11.0)	85 (16.4)	57 (32.1)	71 (43.6)	22 (24.4)	
Do not know	52 (2.8)	33 (7.5)	13 (6.7)	20 (13.5)	4 (5.1)	
Relatives smoking						
None of the relatives smoke	417 (25.7)	85 (18.1)	28 (15.2)	26 (18.6)	13 (15.8)	<0.001
Less than 8 relatives smoke	1038 (63.8)	287 (60.9)	92 (55.8)	85 (53.7)	47 (58.5)	
8 or more than 8 relatives smoke	187 (10.5)	96 (21.0)	47 (29.0)	44 (27.7)	22 (25.6)	
Parent-teen conflict						
No conflicts	1155 (69.1)	281 (58.6)	88 (49.1)	85 (52.9)	58 (69.4)	<0.001
Yes there are conflicts	512 (30.9)	193 (41.4)	79 (50.9)	72 (47.1)	24 (30.6)	
Parental monitoring	10.2 (10.1,10.3)[a]	9.69 (9.52, 9.87)[a]	9.61 (9.26, 9.96)[a]	8.85 (8.41, 9.28)[a]	9.71 (9.26, 10.2)[a]	<0.001
Parental expectation	10.1 (9.95, 10.2)[a]	9.60 (9.39, 9.81)[a]	9.81 (9.42,10.2)[a]	9.67 (9.29, 10.1)[a]	9.87 (9.42, 10.3)[a]	<0.001
Direct ban on smoking						
No	452 (27.1)	131 (28.8)	39 (22.6)	41 (32.0)	14 (17.5)	0.202
Yes	1213 (72.9)	337 (71.2)	128 (77.4)	114 (68.0)	69 (82.5)	
Home discussion						
No	575 (35.1)	199 (43.5)	55 (33.8)	57 (39.5)	22 (28.1)	0.016
Yes	1088 (64.9)	274 (56.5)	112 (66.2)	100 (60.5)	60 (71.9)	

*Actual numbers and weighted percentages are presented. [a]Mean score (95% Confidence Interval)

Table 3. Factors Influencing the Different Smoking Stages-multivariate Multinomial Analysis

Factors		Susceptible never smokers		Experimenters		Current smokers		Ex-smokers	
		Adj. OR[a]	95%CI[b]	Adj. OR[a]	95%CI[b]	Adj. OR[a]	95%CI[b]	Adj. OR[a]	95%CI[b]
Gender	Female	1		1		1		1	
	Male	3.08	2.32, 4.09	5.65	3.39, 9.41	8	4.03, 15.90	3.53	1.70, 7.33
Race	Malay	1		1		1		1	
	Chinese	0.6	0.42, 0.85	0.08	0.04, 0.17	0.27	0.12, 0.57	0.23	0.10, 0.55
	Indians	0.77	0.51, 1.16	0.67	0.36, 1.25	0.62	0.25, 1.52	0.6	0.24, 1.49
	Others	1.17	0.55, 2.49	0.26	0.03, 2.22	1.62	0.32, 8.29	1.06	0.22, 5.08
Best friend smoking status									
	No	1		1		1		1	
	Yes	2.34	1.68, 3.28	4.09	2.56, 6.53	4.75	2.88, 7.83	6.8	3.42, 13.53
Peer pressure	Low Peer Pressure	1		1		1		1	
	High Peer Pressure	1.75	1.20, 2.55	3.83	2.29, 6.42	7.26	4.19, 12.58	2.69	1.36, 5.36
School connectedness		1.07	1.02, 1.12	1.19	1.09, 1.30	1.14	1.04, 1.26	0.95	0.85, 1.07
School adjustment		1.14	1.03, 0.87	1.05	0.87, 1.26	0.89	0.71, 1.12	1.5	1.18, 1.91
Siblings smoking status									
	No siblings/none of the siblings smoke	1		1		1		1	
	Yes siblings smoke	1.13	0.78, 1.65	2.19	1.34, 3.60	3.9	2.35, 6.48	1.41	0.74, 2.67
	Do not know	2.78	1.52, 5.11	2.83	1.04, 7.70	7.1	2.56, 19.71	1.83	0.47, 7.18
Relatives smoking	None of the relatives smoke	1		1		1		1	
	Less than 8 relatives smoke	1.49	1.06, 2.09	1.41	0.77, 2.59	1.29	0.66, 2.53	1..55	0.69, 3.46
	8 or more than 8 relatives smoke	2.97	1.90, 4.64	2.92	1.43,5.96	3.05	1.36, 6.83	3.36	1.36, 8.30
Parent-teen conflict	No conflicts	1		1		1		1	
	Yes there are conflicts	1.39	1.06, 1.83	2.04	1.32, 3.15	1.64	0.98, 2.75	0.89	0.47, 1.71
Parental monitoring		1.09	1.01, 1.18	1.2	1.06, 1.35	1.32	1.14, 1.52	1.21	1.04, 1.41
Home discussion	Yes	1		1		1		1	
	No	1.62	1.23, 2.15	1.36	0.87, 2.13	2.12	1.27, 3.55	1.09	0.59, 2.00

*Reference category: Never smokers. [a]Odds ratio. [b]Confidence interval

status and the presence of a direct ban on smoking by parents showed a significant relationship with the smoking stages.

Table 3 summarizes the results from multivariate analysis on the variables associated with the different smoking stages. Being male was a very strong predictor for all for stages of smoking and had the highest odds of being a current smoker ([a]OR: 8.00, 95%CI: 4.03, 15.90). Having a best friend who smokes and high peer pressure to smoke not only increased the odds of being an ever smoker but also had higher odds of being a susceptible never smokers. When compared to never smokers, susceptible never smokers, experimenters and current smokers had higher odds of having lower school connectedness. We also found that current smokers had high odds ([a]OR: 7.10, 95%CI: 2.56, 19.71) of not knowing whether their siblings smoked. Parent-teen conflicts had the strongest effect on being an experimental smoker ([a]OR: 2.04, 95%CI: 1.32, 3.15). Absence of home discussion on smoking increase the odds of being a susceptible never smoker ([a]OR: 1.62, 95%CI: 1.23, 2.15) and current smoker ([a]OR: 2.12, 95%CI: 1.27, 3.55).

Discussion

The prevalence of current smokers in this study was 5.5%, which is higher compared to the national prevalence among thirteen year old of 3.5% as reported in the Third National Health Morbidity Survey (NHMS III, 2006) but lower than the findings in Malaysian Global Youth Tobacco Survey, 2009 (18.2%). The prevalence of current smoking among the male students was much higher compared to the female students. Peer factors such as best friends' smoking status, peer pressure to smoke; both school factors in this study and family factors such as siblings smoking, number of relatives who smoked, parent-teen conflicts, parental monitoring and home discussion on smoking hazards were the significant predictors of smoking stages. However, there were some differences in the factors associated with susceptible never smokers, experimental smoking, current smoking and ex-smokers when compared to never smokers.

The findings in this study shows a lower prevalence of smoking compared to other studies conducted locally. This could be due to under-reporting and also the fact that this study was conducted among thirteen year olds only. Other local studies that reported higher percentages of smoking were conducted among the older age groups. Among fourth formers who were sixteen to seventeen years old, the prevalence was 35.9% (Nyi et al., 2004) and among form six respondents who were eighteen to nineteen year old it was 22.8% (Afiah et al., 2006). Higher percentage of males smoking compared to females has been observed in other regions (NHMS III, 2006; Golbasi et al., 2011) as well as from other local studies (Lim et al., 2010; Yasin et al., 2013). Similar to the findings from other local studies that Malays are more likely to smoke compared to Chinese (Stanton et al., 1996; Lee et al., 2005), in this study we also found that Malays have higher odds of being susceptible to smoking. Considering this fact our Government should give special attention to the Malay population when planning smoking prevention strategies.

Many studies have looked into the factors associated with smoking behavior among adolescents (Sen et al., 2000; Golbasi et al., 2011) . In order to gain a better understanding on smoking among adolescents in our population, we were interested to identify the different stages of smoking and the degree to which the school,

peer and parental factors influenced tobacco use. Even though some of the factors in this study were associated with all four of the smoking stages, the strength of the level of association varied with each stage.

In agreement with other studies (Sen et al., 2000; Golbasi et al., 2011; Muttappallymyalil et al., 2012), our results showed that peer pressure and peer influence is a major external factor that contributes to adolescents smoking. Similar to some studies (Kobus, 2003; Bricker et al., 2007), we also found that having a best friend who smokes and high peer pressure to smoke both increase the odds of being a susceptible never smokers and ever smokers. We were not surprised to find high peer pressure to smoke had the strongest effect on current smokers as studies have shown adolescents' reports of their peers' tobacco use to mirror their own smoking habits (Silva et al., 2008). However, similar to Wen et al. (2007) we do not know if adolescents choose to be friends with those who smoked or they were being influenced to pick up the habit by their friends who already smoked (Xiaozhong et al., 2007). In this study we also found that ex-smokers reported high peer pressure to smoke and also had the highest odds of having a best friend who smoked. Much remains unknown on the dynamics and tolerance in a relationship between adolescents who smoke and those who do not. We also do not know if ex-smokers will be able to maintain cessation when still befriending smokers.

We included two school related aspects in our study. One, school connectedness- taken as the belief by students that teachers and lecturers cared about their learning, about them as individuals and the students had sense of attachment to their school (Morgan et al., 1991; Blum et al., 2004); the other - school adjustment referring to school related outcomes (Harakeh et al., 2005) and in this study taken as adolescents' perceived ability to cope with their school work compared to their peers. Numerous studies have found an inverse association between school factors and adolescent smoking behavior (Morgan et al., 1991; Tan et al., 2009). Even though our study showed only weak associations between both the school factors and smoking stages, the never smokers in our study had higher school connectedness and school adjustment scores compared to the rest of the smoking stages.

Many studies have reported the association between parents smoking habits and their children's smoking behavior (Bricker et al., 2007; Hoving et al., 2007). However in our study we did not find significant association between any of the smoking stages and parents' smoking behavior. The weaker role of parental smoking in our study compared to the positive association of best friends smoking status with all four smoking stages is consistent with another study that found modeling best friends' tobacco use to be stronger than parental modeling (Chassin et al., 1998; Sen et al., 2000).We found siblings smoking status and having a higher number of relatives who smoked to be associated with the different smoking stages. This association can mostly be explained by Social learning theory (Bandura, 1977) which emphasizes that adolescent learn and model behavior by observing those in their immediate environment and whom they have more contact with (Urberg et al., 1997; Kobus, 2003).

Previous literature support the association between constrained parent child relationship and the risk behaviors of adolescents such as smoking (Laukkanen et al., 2001; Fleming et al., 2002; Simons-Morton, 2004) . In our study, we found the parent-teen conflicts to be a significant predictor of susceptible never smoking and experimental smoking. Several studies have found parental monitoring to be a protective factor against adolescent substance use (Wentzel, 2003; den Exter et al., 2005; Piko et al., 2010). Our study shows some evidence that low parental monitoring is strongly associated with current smoking and experimentation with smoking. It is possible that by monitoring and observing adolescents' activities and type of friends, parents can detect early if their children start initiating smoking and if their peer group member are involved with tobacco use. Though this can help in preventing smoking uptake, it will be challenging to advice adolescents to change their peer group.

Antismoking socialization practices (Engels and Willemsen, 2004) such as parents strictly establishing nonsmoking rules and having discussions on smoking hazards with adolescents were also included in our study. We found that having no home discussions regarding hazards of smoking to be related with susceptible never smokers and current smokers. Although no significant association was found with the presence of a direct ban on smoking and the smoking stages, antismoking socialization practices have been shown to strongly affect adolescents smoking behavior (Engels and Willemsen, 2004). There are also studies that found no relation between home rules, warnings and parent-child discussion on smoking and adolescent smoking behavior (den Exter Blokland et al., 2005).

To our knowledge it is the first to examine the prevalence of different smoking stages including susceptible never smoking among the young adolescents population, locally. We found that almost one fifth of the non-smokers (22.1% of 2143 non-smokers) were actually susceptible to smoking in the future. We identified that there were some variations in the factors associated with the different stages and variations in the strength of association between the factors and the smoking stages.

There are some limitations in this study that should be noted as well. Data was collected through self-reports by adolescents. No biochemical verification was used to confirm smoking status of these adolescents. However, studies have shown that the self-reports are generally reliable (Mokdad et al., 2004). Data from the early stages of this on-going longitudinal study cannot provide evidence of causality between the stages and factors. The present study only takes into account peer, school and parental factors involvement with the different stages. Other variables, for example, personal characteristics and adolescents' perception of smoking behaviour were not included in this study.

In conclusions, the results in this study indicate that the adolescents in lower secondary are in different stages of smoking behaviour. There were also a substantial proportion of non-smokers who were either susceptible or contemplating to smoke. Studies have shown susceptibility to be an independent predictor for smoking

experimentation (Giovino, 2002) and experimentation increases the risk for future nicotine dependence (Harrell et al., 1998; Simons-Morton et al., 2003). With this regard, reaching out to adolescents who are susceptible is crucial. The study results also demonstrated that some factors were more relevant to one of the stages than the other. Given the fact that cessation once addicted to smoking, is complicated by relapses, identifying the differences and developing specific programs to help prevent escalation to a higher stage of smoking is also important.

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