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Peer and Parental Influences on Adolescent Smoking

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Purpose. The purpose of this study was to determine the relationship between peer and parental factors and smoking behavior of adolescents in urban cities and to investigate whether there are gender differences.

Methods. A stratified and random cluster sampling design was used to obtain a cross-sectional sample of high school students in two urban cities. The sample consisted of 512 Korean adolescents (256 boys and 256 girls) aged 15 to 18 (mean age 16.7±.58). Self-reported questionnaire consisted of adolescent smoking behavior, peer smoking and alcohol use, parental smoking and alcohol use, father-mother-peer relationships and perceived social support from peers and parents. Multiple logistic regression analysis was used to examine the hypothesized model.

Results. The findings showed that peer and parental factors accounted for 30.3% of the variance in adolescent smoking and peer smoking was most strongly associated with adolescent smoking behavior (OR = 10.18). In addition, peer smoking (OR = 4.71), peer alcohol use (OR = 4.21), and peer relationships (OR = 1.03) were significantly associated with boys' smoking behavior. In girls, peer smoking (OR = 26.50) and parent smoking (OR = 5.48) were significantly associated with smoking behavior.

Conclusions. Consistent with previous findings, peer smoking is a significant factor on adolescent smoking. Specifically, boys would be more influenced from peers than girls. Therefore, smoking prevention programs for adolescents might be focused on the social context such as, resisting to peer pressure and enhancing the self-efficacy to control.

Key Words : Adolescents, Smoking, Parents, Friend

INTRODUCTION

The prevalence of smoking in high school boys is 22.1% and 6.8% in girls (Korea National Statistical Office, 2003). However, adolescent smoking prevalence was reported as 26% in a study on urban adolescents (Kim, 2004). Han et al (2001) surveyed 1,259 high school students and found that 32% of students reported smoking regularly, especially adolescents in urban setting, who were 2.47 times more likely to be smokers than rural setting. Moreover, the prevalence of young girls' smoking increased from 2.2% in 1993 to 6.8% in 2003 (Korea National Statistical Office, 2003).

It is no question that smoking cause serious adolescent health problems and can induce negative consequences with lasting effects into adulthood. Adolescent smoking is highly associated with nicotine dependency, other substance abuse, developing chronic obstructive pulmonary disease (COPD) or lung cancer, and developing cardiovascular diseases etc. (Lewis et al, 2001; Perry & Staufacker, 1996; Turbin, Jessor, & Costa, 2000).

According to Bandura's social learning theory, individuals have the capacity for vicarious learning. That is

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learning by observation. Adolescents are more likely to imitate the activities and actions of those they consider their social models (Green & Piel, 2002). Thus, adolescents who observe significant others' smoking behavior in their environment may learn smoking and will be more likely to smoke. Therefore, peers and parents, who form adolescents' proximal environment, are considered important influencing factors in their smoking behavior. Numerous researches on adolescent smoking behavior have continuously been reported that peer and parent smoking behavior and alcohol use are associated with adolescents' smoking (Biglan, et al, 1995; Cheong, 2003; Choi, 2000; Conrad et al, 1992; Kim, 2003; Pinilla et al, 2002; Richter, Richter, 2001; Vries, et al., 2003). In addition, while parents smoking had stronger influence in girls than boys, peers smoking had stronger influence in boys (Lee et al, 2000; Perry, Staufacker, 1996; Taylor, 2004).

Although the relationship with peers and parents and the perceived social support from them are strongly associated with initiation and maintenance of health behaviors, most studies on adolescent smoking focused on peer and/or parental smoking behavior. Therefore, relatively little empirical research has been investigated the effect of the relationship with peers and parents, and the perceived social support on adolescent smoking in Korea.

According findings of Kim (2002), parents-child relationships had a direct effect on delinquent behavior in boys, while it had an indirect effect on delinquent behavior of girls. In addition, Lee (2002) reported that relationship with peers and parents and perceived social support had directly negative effect on adolescent smoking in spite of positive effect of stress. In general, previous studies consistently reported that parents-child relationships and perceived social support from parents is negatively associated with adolescents smoking (Biglan, et al, 1995; Denham, Meyer, & Toborg, 2004; Foshee, & Bauman, 1992; Harakeh, et al, 2004).

However, the effects of peer relationships and perceived social support from peers are more contradictory. In a longitudinal study with a high school sample, the quality of the parent-child relationship was negatively related to substance use. Peer relationship, which was the amount of time spent in peer activity, was positively related to substance use, but the intimacy of the relationship with a best friend was negatively related to substance use (Turner, 1999). Go (2002) reported that there was no significant difference in adolescents' smoking according to their peers relationship. While Buysse (1997) reported that peer support had a direct effect on antisocial behaviors, Barrera et al (1993) did not find the relationship between peers support and externalizing behavior.

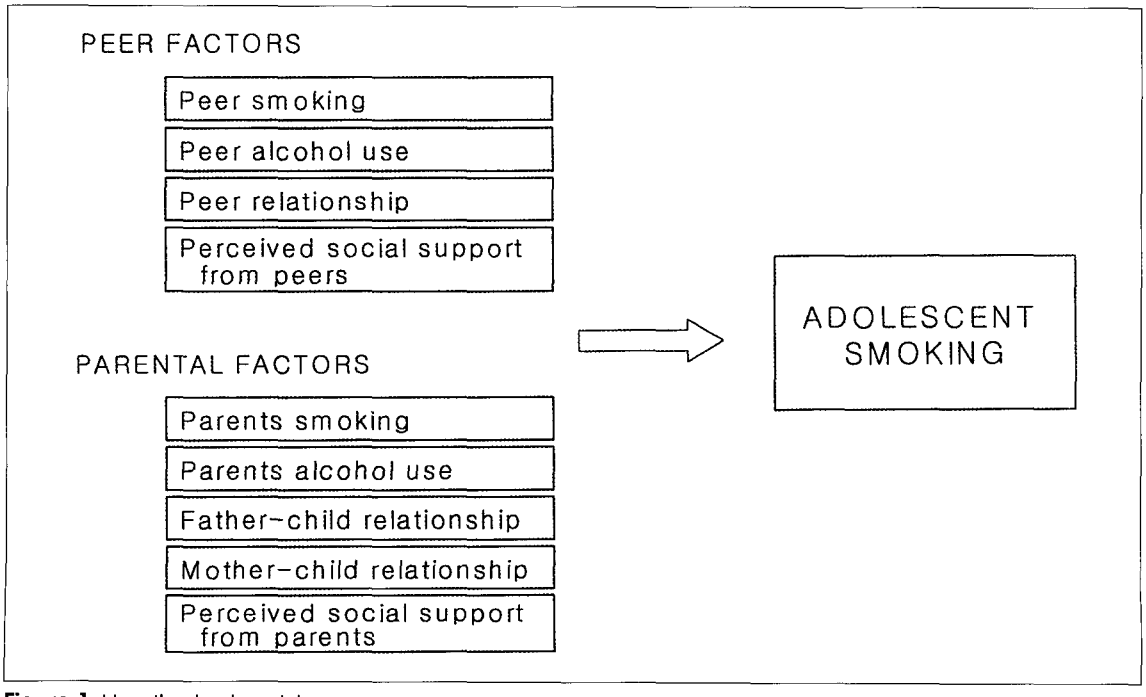

Figure 1. Hypothesized model.

Recently, researchers suggest peers and/or parents should involve in smoking prevention program for adolescents because peers and parents may be crucial in initiating and sustaining positive health behavior in adolescents. Therefore, this study was done to investigate the peer and parental influences on smoking behavior in adolescents for the basis of smoking prevention program for adolescents.

Aims

The purpose of this study was to determine the relationship between peer and parental factors and smoking behavior of adolescents in urban cities (Figure 1) and to investigate whether there are gender differences. Our specific questions were: (a) Do peer and parental factors influence adolescent smoking? (b) What degree do each factors predict the likelihood of smoking in adolescent? (c) Whether there are gender differences?

METHODS

Participants

Participants were recruited from six high schools located in two urban sites of Korea and two classes were randomly selected at each school. The study was approved by the school administration. Participants reported their responses on the questionnaires anonymously. Students were informed that (a) their participation was voluntary, (b) they could refuse to answer any item, and (c) there would be no adverse consequence for refusal. The response rate was 90%.

A total of 512 Korean high school students (256 boys and 256 girls) participated in this study. The age of the participants ranged from 15 to 18 years old.

Measures

We took permissions from developers of instrument. The instruments were translated into Korean by researcher, back translated into English by two bilingual native Koreans. Then pilot study was performed by three high school students.

Adolescents' smoking behavior

To assess adolescents' smoking behavior, respondents were asked to fill out which stage of smoking applies to them; "How often do you smoke cigarettes?" On a five-point scale, response categories were never used (1), tried once-twice (2), tried four-five times (3), usually smoke a few times a week (4), and daily smoke (5). For the logistic analysis, it was dichotomized into never smoked (0) and smoked once or more (1).

Peer smoking, Peer alcohol use

Peer smoking was assessed by the question. "Do you have friends who smoke cigarettes?" Response categories were NO (0) and YES (1). Peer alcohol use was assessed by the question. "Do you have friends who drink alcohol?" Response categories were NO (0) and YES (1).

Parent smoking, Parent alcohol use

Parent smoking was assessed by the question. "Do your parents smoke cigarettes?" Response categories were NO (0) and YES (1). Parent alcohol use was assessed by the question. "Do your parents drink alcohol?" Response categories were NO (0) and YES (1).

Father, Mother, Peer relationships

The quality of the relationships with father, mother, and peers was assessed by the Inventory of Parent and Peer Attachment (IPPA: Armsden & Greenberg, 1987). The IPPA was designed to assess adolescents' perceptions of the positive and negative affective / cognitive dimension of relationships with their parents and close friends, particularly how well these figures serve as sources of psychological security. The IPPA consists of 25 items in each of the mother, father, and peer sections (e.g., 'My mother / father / friends accept me as I am', 'My mother / father / friends can tell when I'm upset about something', 'Talking over my problems with my mother / father / friends makes me feel ashamed or foolish.'). Responses were recorded on a 5-point scale, ranging from almost never or never true (1) to almost always or always true (5). Armsden & Greenberg reported internal reliabilities (Cronbach's alpha): mother attachment .87, father attachment .89, and peer attachment .92. Three week test-retest reliabilities were .93 for parent attachment and .86 for peer attachment. Armsed & Greenberg suggested construct validity with factor analysis, and the considerable studies supported IPPA concurrent validity (Armsed &Greenberg, 1987; Lewis, Woods, & Ellison, 1987; Noom, Dekovic, & Meeus, 1999). Cronbach's alpha in this research was .94 for all 75-items: mother attachment .92, father attachment .94, and peer attachment .92.

Perceived social support from peers and parents.

Perceived social support was assessed by the Perceived Social Support-Friend, Family (Pss-Fr, Fa: Procidano & Heller, 1983). The PSS was designed to assess the degree one perceives his/her needs for support, information, and feedback is fulfilled by friends or family. The PSS consists of a 20 items in each of the friend and family sections (e.g. 'I rely on my friends / family for emotional support', 'My friends / Members of my family are good at helping me solve problems'). The PSS is scored "yes" (1), "no" (0), and "don't know" (0). Scale scores are the total of item scores and range from 0 to 20. Higher scores mean more perceived social support. Internal consistency of PSS was reported by three samples; college students (Ferraro, & Procidano, 1986; Procidano, & Heller, 1983), high school girls (Procidano, Guinta, & Buglione, 1988), and male multiple sclerosis patients (Louis, 1986). Cronbach's alphas ranged from .88 to .91 for PSS-Fa and from .84 to .90 for PSS-Fr. The test-retest correlation of stability over a one-month period was .83. Procidano & Heller (1983) reported construct validity and concurrent validity. The PSS was negatively related to psychopathology but, positively related to social competence. Cronbach's alphas in this sample were .87 for all 40-items, .77 for PSS-Fr, and .88 for PSS-Fa.

RESULTS

Participants were 256 boys and 256 girls who ranged in age from 15 to 18 years (mean age 16.7 years, S.D. 0.58). The student's Grade Point Average was 6.5% A, 13.1% B, 27.3% C, 33.1% D, and 20.0% F. Approximately ninety four percent of students live with both parents. Among participants, 97.6% of fathers and 42% of mothers were employed (Table 1).

Approximately twenty four percent of adolescents reported an experience of smoking. Among adolescents who reported experience of smoking (N=120), 45% of those tried once-twice, 20% tried 5-4 times, 13% usually smoked a few times a week and 22% reported daily smoke. Also, 33% of boys were smokers and 14% of girls were smokers (Table 2). This is higher prevalence than the report of the Korea National Statistical Office (2003), however it is almost similar to many previous studies on high school students (Han et al, 2001; Kang & Jang, 2003; Kim, 2004).

Using logistic regression, we explored the effects of peer and parental factors on smoking behaviors (Table 3). Based on Hosmer & Lemeshow test, the estimated model fitted the observed data (Chi-square = 7.98, df = 8, Sig. = 0.44). The model accounted for 30.3% of the variance in adolescents' smoking. In addition, peer smoking was significant predictor of adolescent smoking.

Table 1. Demographic Characteristics (N=512)

Characteristics		Frequency (%)	Mean (±SD)	Range
Gender	Boys	256 (50)		
	Girls	256 (50)		
Age			16.7(±0.58)	15-18
GPA (N=490)	100-90	32 (6.5)		
	89-90	64 (13.1)		
	79-70	134 (27.3)		
	69-60	162 (33.1)		
	59-	98 (20.0)		
Types of	Both parents	472 (93.7)		
living arrangement	Others	40 (6.3)		
Father's employment	Not employed	12 (2.4)		
status (N=500)	Employed	488 (97.6)		
Mother's employment	Not employed	293 (58.0)		
status (N=505)	Employed	212 (42.0)		

Table 2. Smoking Behavior of Adolescents

		Boy	Girl	Total
Smoking (N=511)	No	171 (67.1%)	220 (85.9%)	391 (76.5%)
	Yes	84 (32.9%)	36 (14.1%)	120 (23.5%)

Adolescents who had smoking peers were 10.18 times more likely to be smokers (CI= 4.91-21.12).

In boys, the results from Hosmer & Lemeshow test were Chi-square = 4.58, df = 8, Sig. = 0.80. The estimated model fitted the data and accounted for 28% of the variance in boys' smoking. Among peer and parental factors, peer smoking, peer alcohol use, peer relationship and perceived social support from peer were statistically significant predictors of boys' smoking. Thus, boys with peers who smoke (OR=4.71) and drink alcohol (OR=4.21) and who have higher peer relationship (OR=1.03) and lower perceived social support from peers (OR=0.90) were more likely to be smokers.

In girls, the estimated model fitted the observed data (Chi-square = 9.49, df=8, Sig.=0.30). The model accounted for 39% of the variance in girls' smoking. Peer smoking and parent smoking were statistically significant predictors of girls' smoking. Among girls, adolescents with peers (OR=26.50) and parents (OR=5.48) who smoke were more likely to be smokers.

DISCUSSION

This study analyzes the influencing factors on adolescents smoking behavior using sample of data on 512 high school students in two urban cities.

According to results from logistic regression analysis, peer and parental factors, which included alcohol use, relationship and perceived social support as well as smoking status, accounted for 30.3% of the variance in adolescents' smoking. In study of Kim (2004), he reported that psychological variables such as locus of control, self-esteem, and self-efficacy, gender, and age accounted for 30% of the variance in high school students' smoking. Because adolescents' smoking may be explained by sociodemographic, environmental, behavioral, and per-

Table 3. Multiple Logistic Regression on Smoking Behavior in Adolescents

Variable	B	S.E.	OR	95% CI	p
Peer Factors					
Peer smoking	2.32	0.37	10.18	4.91-21.12	0.00
Peer alcohol use	0.53	0.50	1.69	0.63-4.52	0.30
Peer relationship	0.01	0.01	1.01	0.99-1.03	0.33
Perceived social support from peer	-0.04	0.04	0.96	0.88-1.04	0.34
Parental Factors					
Parents smoking	0.23	0.25	1.26	0.77-2.04	0.36
Parents alcohol use	-0.03	0.35	0.97	0.49-1.92	0.94
Father-child relationship	-0.01	0.01	0.99	0.98-1.01	0.20
Mother-child relationship	-0.01	0.01	1.00	0.98-1.01	0.60
Perceived social support from parents	-0.04	0.03	0.96	0.91-1.03	0.24
Constant	-2.27	1.13	0.10		0.05

Hosmer & Lemeshow test Chi-square = 7.98, df = 8, Sig. = 0.44: Nagelkerke R Square = 0.30

Table 4. Multiple Logistic Regression of Smoking Behavior for Gender

Variable	BOY		GIRL	
	B (S.E.)	OR (95% CI)	B (S.E.)	OR (95% CI)
Peer Factors				
Peer smoking	1.55 (0.48)	4.71 (1.83-12.12)*	3.28 (0.71)	26.50 (6.55-107.226)*
Peer alcohol use	1.44 (0.73)	4.21 (1.01-17.59)*	-0.84 (0.79)	0.433 (0.09-2.03)
Peer relationship	0.03 (0.01)	1.03 (1.00-1.06)*	-0.02 (0.02)	0.98 (0.94-1.03)
Perceived social support from peer	-0.11 (0.05)	0.90 (0.81-0.99)*	0.10 (0.08)	1.10 (0.94-1.28)
Parental Factors				
Parents smoking	-0.23 (0.31)	0.80 (0.44-1.45)	1.70 (0.60)	5.48 (1.71-17.61)*
Parents alcohol use	-0.21 (0.43)	0.81 (0.35-1.90)	-0.34 (0.75)	0.71 (0.16-3.09)
Father-child relationship	-0.02 (0.01)	0.98 (0.96-1.00)	-0.00 (0.01)	1.00 (0.97-1.03)
Mother-child relationship	-0.01 (0.01)	0.99 (0.97-1.01)	0.01 (0.02)	1.01 (0.97-1.04)
Perceived social support from parents	-0.01 (0.04)	0.99 (0.92-1.06)	-0.11 (0.06)	0.90 (0.80-1.02)

* $p < .05$

sonal factors, researchers should concern the findings from diverse researches about the relationship between them.

In addition, our results revealed that adolescents are at greater risk of smoking when they have peers who smoke. Based on social learning theory, many researches suggest the importance of peer smoking on adolescents' smoking. Vries et al (2003) surveyed 15,705 adolescents from six European countries. They reported that friends' smoking and best friend's smoking had significant effects and accounted for 38% of the variance in adolescents smoking. Kim (2003) surveyed 3,000 students of middle and high school and reported influence of friends, teachers, and family members were important to adolescents' smoking. In addition, Lee et al (2000) reported that peer smoking was important predictor of smoking in high school student. According to Choi (2000), the smoking of father and friends had an indirect effect on adolescent smoking through planned behavior and smoking intention. Conclusively, adolescents are more likely to imitate the activities and actions of their significant others. Also, smoking behavior seems to be a part of peer associations and peer bonding in adolescents. They generally attempt their first smoking with their peers and become smokers by exchange reinforcement with their peers. Our findings support social learning theory and revealed that peer smoking is more important than other peer and parental factors on adolescents' smoking.

In longitudinal regression analysis, however, Vries et al (2003) reported that parental smoking was to be as predictive of smoking onset after 1 year as best friends' smoking status. They emphasized that many researches have overestimated peer influence on adolescent smoking, while they have underestimated parental influence. Our findings from the cross-sectional data also showed that peer smoking was the most important predictive factor of adolescent smoking. However, for testing and understanding of parental influence in adolescent smoking, a longitudinal research design will be needed in future studies.

Contrary to expectation, relationship with peers or parents and perceived social support was not found statistically significant. Go (2002) analyzed the effects of relationships with peers and parents on adolescent smoking using data on 678 high school students in Seoul. The group of experimental smoker or regular smoker was shown more negative relationship with their parents than non-smoking group. However, there was no significant difference in adolescent smoking according to peer relationship. According to Tilson et al (2004), close relationship with parents is protective against youth smoking. However, close relationship with parents may not protect children from becoming smokers when parents smoke. In addition, Harakeh et al (2004) reported that the quality of the parent-child relationship affected adolescents' smoking behavior indirectly through smoking-relating cognition and intention, while parental smoking behavior had a direct effect. Therefore, though quality of relationship with peers and parents and perceived social support is important influencing factors, peer and parent smoking behavior have more direct effects on adolescents smoking.

Some interesting differences between genders can be noted. Boys are at a much greater risk of smoking when they have peers who smoke and drink alcohol and have a high level of relationship with their peers. However, girls are at much greater risk of smoking when they have peers and parents who smoke. Our findings consist with previous studies. Lee et al (2000) surveyed 1,380 students of high school and reported that the attitude score, drinking status and close friend's smoking status were influencing factors on boys' smoking and the knowledge score, the attitude score, drinking status, close friends' smoking and siblings' smoking influenced girls' smoking. According to Taylor et al (2004), while mother smoking and best friend smoking were significant predictors smoking in boys, mother smoking, father smoking, and best friend smoking were significant predictors girls' smoking. Conclusively, because boys are more likely to smoke for peer associations and bonding, they are more vulnerable to be influenced by peers than girls.

CONCLUSION

Peer and parental factors, alcohol use, relationship with peers and parents, and perceived social support from peers and parents as well as smoking of peers and parents, accounted for 30.3% of the variance in adolescents' smoking behavior. Especially, peer smoking was found to be a significant influencing factor on adolescents smoking behavior. In addition, there are gender differences in influencing factor on adolescents smoking behavior. Our findings provide empirical evidences for effects of social influence in adolescents smoking.

Based on our findings, we suggest several implications. First, programs for smoking prevention in adolescents

should include training for resisting to peer pressure to smoke; especially boys and enhance the self-efficacy to control the influence from peers. Second, parents' good, secure and cohesive relationships with their child along with monitoring are important because these prevent adolescents from associating with smoking peers.

Although this study provides empirical evidences for the social learning theory, there are a few limitations. This study is based on adolescents' self-reporting in the classroom, so there is the possibility for respondents to underreport their own smoking behavior.

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