

PATHWAYS TO SMOKING AND DRINKING: THE ROLE OF FAMILY FUNCTIONING, SUPPORTIVE PARENTING, SELF-CONTROL, RISK AND PROTECTIVE FACTORS IN THAI ADOLESCENTS

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ABSTRACT: The purpose of this study was to test a model of how parenting, family functioning and self-control are related to risk and protective factors and their effects on smoking and drinking behavior among Thai adolescents. The model was tested with 676 Thai high school students collected through simple random sampling from grades 10-12 with the mean age of 16.7 years in Bangkok area. The developed model consisted of seven latent variables: family functioning, supportive parenting, good self-control, poor self-control, protective factors, risk factors, and smoking and drinking behavior. Data were collected by questionnaires with reliability ranged from .85 - .95. Findings from the analysis were best fitted to the empirical data. Structural equation model analysis indicated that supportive parenting was linked with smoking and drinking directly and indirectly through risk factors and good self-control, while family functioning was linked with smoking and drinking indirectly through good self-control and poor self-control. All independent variables in the model explained 82.3 percent of the smoking and drinking in Thai high school students.

Keywords: Smoking, Drinking, Family functioning, Supportive parenting, Self-control, Risk factors

INTRODUCTION: Teenage is the period of intensive health-risk behavior from substance use, including smoking and alcohol drinking, the two substances use mostly found among teenagers. The percentage of teenagers who start smoking and drinking during secondary school and high school tends to increase^{1,2}. This could result, both immediately and chronically, in poorer health than their peers without such risky behavior³. A number of studies worldwide have been devoted to various factors effecting smoking and drinking, especially among teen students⁴⁻⁶. The focus on this population stems from research evidences showing that smoking in adulthood starts from teenage experiment^{3,7}.

Thailand is one of the countries exerting with a high incidence of adolescence smoking and drinking¹. The survey of National Statistical Office of Thailand⁸ from the years 2004-2008 reported that the percentage of smoking rate in Thai youths slightly reduced from 11.2% in 2004 to 10.9% in 2006. However, in 2007 the percentage of smoking rate increased to 12.1%. This survey suggested that such rapid increase was found only among teenagers, while those of other age groups reduced. Moreover, Thai adolescents have lower rate of age engaging the substances use

such as smoking and drinking behavior, in contrast with decline among adults⁸.

The greater severity of this issue led several researchers to develop the causal relative model of smoking and drinking behavior in adolescence by combining all relevant factors based on theories, concepts, and research within this arena to create a model for testing the relationship patterns of each factor contributing to smoking and drinking behavior in this age group.

Wills *et al.* (2007) developed one such model and test its validation, finding that certain familial factors, family functioning and parenting are exogeneous variables intermediating both risk and protective factors leading to smoking and drinking behavior⁴. This is supported by Ecological Theory⁹ that indicates that children are initially influenced by their immediate factors: the closest one is family. Besides the family as an exogeneous variable to substance use behavior, there is another set of mediating variables- self-control, protective factors, and risk factors- inserting between family functioning and parenting and the final behavior¹⁰.

Although there are a number of empirical studies in model of substance use⁴⁻⁷, little information concerning co-occurrence of substance use among

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Thai adolescents is available. Thus, the purpose of this study was to test a model of how parenting, family functioning and self-control are related to risk and protective factors and their effects on smoking and drinking behavior in Thai high school adolescents.

The results are needed to depict the relation among those variables that are linked to smoking and drinking behavior in high school students.

MATERIALS AND METHODS:

Participants

Participants (55% male) were 676 high school students in Bangkok, Thailand collected through simple random sampling from grades 10-12 with the mean age of 16.7 years (SD=0.97)

Procedure

A self-report questionnaire was administered with students in classrooms by the research staff. The questionnaire took approximately 30 min to answer. The survey was administered under the confidential conditions and certified by the Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University for confidential data protection.

Data analysis

Data were analyzed by using structural equation modeling (SEM) to examine the direct effects and indirect effects of the outcomes. SEM was performed with LISREL 8.72 software using maximum likelihood (ML) estimation. The covariance matrix was used as input. The measurement errors were allowed to be related. Overall fit of this model was evaluated by considering three criteria, the Chi-square, root mean square error of approximation (RMSEA) less than .08³⁰⁾, and the comparative fit index (CFI) greater than .90³¹⁾. Additionally, fit was also evaluated by checking standardized residuals greater than 2.00. The relative Chi-square (χ^2/df ratio) of 3.00 or less with CFI and NNFI at .90 or higher is considered of very good model fit³²⁾. Missing data were handled prior to analysis by replacing average score computation in the missing items. Total overall missing data was less than 2%.

Self-Report Measurement

All items, including family functioning scale, supportive parenting scale, self-control scale, attitude toward drinking in adolescence and attitude toward smoking in adolescence, were adapted from English to Thai by translating and creating some items related to the variable construct. Then, the analysis of corrected item - total correlation (CITC) was applied for selecting the quality items that met the items correlation criterion. The internal consistency of all items was calculated for ensuring the good validity and reliability to suit Thai adolescent samples before test administration.

Family Functioning: This scale was measured by 23 items adapted from the McMaster Family Assessment Device (FAD)³³⁾. The scale assessed the whole family functioning with 6 domains including **affective involvement** (four items, e.g., *Much negative feelings arise in my family*); **communication** (four items, e.g., *We usually speak directly to one another rather than through a mediator or others*); **affective response** (four items, e.g., *We can reveal what is in our mind to one another*); **problem solving** (four items, e.g., *We try to think of a variety of ways to deal with troubles*); **role** (four items, e.g., *When someone in the family is in trouble, the others usually get involved too much in the issue*) and **behavioral control** (three items, e.g., *I can break the family's rules without any consequence*). The answer had a 4-point response scales ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). A 24-item scale for family functioning had $\alpha=.84$. The item scores were summed and a higher score meant a healthier family functioning.

Supportive Parenting: This measurement was adapted from Baumrind³⁴⁾. Sixteen items were created for measuring two dimensions: **demanding** (e.g., *I can ask for advising from my parent*) and **responsiveness** (e.g., *parents' support for academic competence in school*). Sixteen-item scale for supportive parenting had $\alpha=.91$. Responses were measured on 4-point scales ranging from 1 (*strongly disagree*) to 4 (*strongly agree*).

The parameters for the model tested:

Family functioning and supportive parenting on substance use

These variables have been found to be the key factors to predict smoking experiment as well as drinking in adolescents^{10,11}. Unhealthy family functioning and lack of supportive parenting skills are strongly associated with the substance use initiation. Adolescents who have low affective relationship with their parents are more likely to engage in and to experiment substance¹². Asian-American adolescents who reported never smoking have higher healthy family functioning compared with user adolescents¹³. Besides, the linkage between family functioning and substance use were supported by several empirical studies^{12,13}. Another important construct that is related with substance use is support from parenting^{4,10,14}. Parenting support, demonstrated by close relationship, caring, accepting of relationship between adolescent and family caregivers, is often offered through parental involvement, familial affection, and parental warmth^{14,15}. The study showed that nurturant/involved parenting is linked with substance use in adolescence but the effect has been sent indirectly through self-control⁴. The longitudinal study of adolescent health suggested that parenting was directly associated with less problems in young adulthood¹⁴. Studies in western adolescents have also revealed how supportive parenting is related to several kinds of competence development^{4,16}. The authoritative parenting is associated with high levels of academic performance, study skills, and less engagement in risk behavior¹⁷. Parenting styles do not affect adolescent substance use directly but through an mediating variables that are involved with adolescent substance use initiation^{4,18,19}. Antecedents of self-control are supportive family relationships and influences from protective factors, including competence at school, and risk factors such as attitude toward deviance-prone behaviors^{20,21}. The risk factors such as substance use prototypes and substance willingness were mediating variables that had indirect effect on adolescent substance use⁴. The relation of social-image processes including prototypes of adolescents who do or do not engage in substance use has been suggested by social perception theory²².

Good Self Control vs Poor Self-Control

Self-control can be measured with several indicators. In this study, good self-control was measured with soothability, delay of gratification, and problem solving, while poor self-control was measured with impulsiveness, distractibility, and impatience. The constructs of self-control were divided into two separate parts by prior analysis, and it was posited theoretically as the distinct constructs with empirical support^{4,23,24}. Good self-control negatively affects substance use, whereas poor self-control positively affects substance use^{4,25} and both help explain variability in health-compromising behavior²⁶.

Risk and Protective Factors

Protective factors are defined as the positive and prosocial activities that promote conventional behavior, including school performance, peer supports, self-esteem²⁷, while risk factors refer to those providing opportunity for involvement in problematic behavior (eg. cigarette smoking and drinking). Risk factors include willingness to engage in such behavior, prototypes²⁸, and attitude toward substance use^{4,21}. These are supported by past research showing that adolescents with poor school competence including academic competence, positive peer relationships, and teacher relationships were also encouraged to substance use²⁹. It can be concluded that protective and risk factors have direct influence on smoking and drinking behavior and are, at the same time, mediators directly and indirectly influenced by family functioning and supportive parenting. Self-control, however, seems to directly affect risk or protective behavior. The previous study in substance use and sexual behavior indicated that positive relationships between parents and adolescents are associated with lower likelihood of smoking and drinking behavior⁴.

Pathways to substance use

Previous research suggests that self-control is not directly related to adolescent substance use but is represented as a mediator that is involved in the model of substance use^{4,19}. Self-control is determined by supportive family relationships and perception of family functioning²⁰ and it passes the effect on protective factors, including school performance, peer supports, self-esteem^{4,27}, and risk factors, including willingness to engage in such behavior, prototypes²⁸, attitude toward substance use^{4,21}. This is supported by previous research showing that adolescents with poor school competence skills including academic competence, positive peer relationships and teacher relationships are also encouraged to substance use²⁹.

Self-control: Three constructs of good self-control and three constructs of poor self-control were derived from previous research⁴. The indicators of good self-control were **soothability** (four items, e.g., *I can calm down easily when I am excited*); **delay of gratification** (four items, e.g., *I can wait for something*) and **problem solving** (four items, e.g., *I like to plan before doing something*). A 12-item scale for good self-control had $\alpha=.84$. The indicators of poor self-control were

impatience (four items, e.g., *it hard for me to wait in line*), **distractibility** (four items, e.g., *I like to switch from one thing to another*), and **impulsiveness** (four items, e.g., *I do things without thinking*). A 12-item scale for poor self-control had $\alpha=.84$.

Protective Factors: Coopersmith self-esteem inventory (SEI): the school form was developed into Thai language³⁵. This 25-item inventory was used to assess students' **self-esteem**. The SEI has

been widely used and has established construct validity, even among Thai population, which was assessed by the known-group technique³⁴. Responses were measured on 2-point scales with “yes” and “no”. Sample items include “*Things usually don’t bother me*” and “*there are lots of things about myself I would change if I could*”, etc. The 25-item scale for self-esteem had $\alpha = .82$.

Three items of **school performance** were derived from the subscale of adolescent positive adjustment³⁶. The items asked about grade point average, agreement or disagreement that one had a high grade point average (5-point scale) and got along well with teachers (5-point scale). The factor scores were computed from the three items to create one indicator of protective factors.

Six items of **positive peer relationship** were derived from the subscale of adolescent positive adjustment³⁶, including friends’ support for conventional activities in school and for curriculum in class (5-point scale $\alpha = .84$).

Risk Factors:

A 13-item scale of **attitude toward drinking in adolescence** was developed by creating items following the attitude construct of affection and behavior (5-point scale $\alpha = .84$; 13 items, e.g., *drinking behavior in adolescence is unconventional behavior*).

A 13-item scale of **attitude toward smoking in adolescence** was developed by creating items following the attitude construct of affection and behavior (5-point scale $\alpha = .84$; 13-items, e.g., *smoking behavior in adolescence is unconventional behaviors*).

Substance use willingness: This measure was derived from previous research^{37,38}. The items asked about willingness to use alcohol and smoke cigarette. The introducing sentence was “*Suppose you were in a group of adolescents of your age and there were some alcohol you could have if you wanted. How willing would you be to do the following things?*” The items were one drink, have more than one drink, get drunk. Responses were made on 4-point scales ranging from 1 (*not at all willing*) to 4 (*very willing*).

Prototypes of substance users: This prototypes of user measurement³⁷ was led by the

introduction “*Take a moment to think about the adolescent your age who smokes or drinks*”, followed by adjective descriptor stems, such as “*popular*”, “*careless*”. Each item had a 7-point response scale with the anchor points “*not at all*” to “*very*”. Measurement of prototype was obtained for smokers ($\alpha = .88$) and drinkers ($\alpha = .89$). The higher the score was, the more favorable the perception of substance users would be.

Substance use: The items derived from previous substance use research⁴) were presented to participants, including smoking measurement items: “*How often do you smoke cigarettes/drinking alcohol?*”. Responses were scored on 0-5 scales ranging from 0 (*never used*) to 5 (*every day*). “*During the past 3 month, how much have you smoked cigarettes?*” (7-point response scale: from none to two packs) and “*During the last month, how much have you smoked cigarettes?*” (5-point response scale: from *never* to *one pack a day*). The items on drinking asked “*How often do you drink alcohol in the past 3 month?*”. Responses were scored on 0-5 scales, as 0 (*never used*), 5 (*every day*). Frequency of heavy drinking was assessed by item indicating the frequency of drinking 5-7, 8-10 and 11 or more drinks in a single day. The factor scores were computed from three indicators of drinking and three indicators of smoking. Then, the factor scores were taken to analysis in the next part.

RESULTS:

Pathways of Substance Use

The correlations of observed variables were analyzed and presented in Table 1. To test the hypothesized pathway, analysis was performed with LISREL 8.72³⁹. The missing data was treated by replacing average score computation. The measurement model was computed and latent constructs with several indicators were used. In the analysis, the model specified parenting and family functioning as exogenous variables which have no prior variables predicted. Highest correlation among exogenous variables are approximately .70 (highly correlation detected by VIF and Tolerance indicated that variables had collinearity problem; however in these results, the coefficient was not detected by those indices). Self-

Table 1 Intercorrelation of observed variables

variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. Aff. Invol.	1.00																						
2. Commu.	0.44	1.00																					
3. Aff. Res.	0.43	0.44	1.00																				
4. Prob.	0.40	0.56	0.41	1.00																			
5. Role	0.45	0.29	0.41	0.29	1.00																		
6. Beh. Con.	0.22	0.11	0.18	0.21	0.25	1.00																	
7. Demand	0.44	0.49	0.38	0.46	0.34	0.18	1.00																
8. Response	0.45	0.49	0.45	0.46	0.36	0.16	0.88	1.00															
9. Impulsive	-0.32	-0.21	-0.27	-0.24	-0.23	-0.25	-0.31	-0.32	1.00														
10. Distract	-0.36	-0.27	-0.35	-0.29	-0.35	-0.15	-0.35	-0.37	0.53	1.00													
11. Impatience	-0.36	-0.29	-0.38	-0.29	-0.29	-0.23	-0.37	-0.40	0.53	0.61	1.00												
12. Soothability	0.13	0.23	0.14	0.21	0.10	0.03	0.23	0.20	-0.25	-0.22	-0.23	1.00											
13. Delay_grat.	0.33	0.28	0.30	0.27	0.20	0.28	0.37	0.35	-0.46	-0.46	-0.54	0.38	1.00										
14. Problem	0.19	0.23	0.19	0.34	0.09	0.11	0.36	0.33	-0.27	-0.26	-0.25	0.27	0.37	1.00									
15. Esteem	0.40	0.41	0.42	0.34	0.35	0.09	0.43	0.49	-0.33	-0.41	-0.40	0.19	0.27	0.21	1.00								
16. School Per.	0.21	0.26	0.21	0.26	0.12	0.15	0.38	0.38	-0.30	-0.31	-0.32	0.17	0.34	0.28	0.37	1.00							
17. Positive peer	0.26	0.33	0.18	0.28	0.17	0.08	0.40	0.36	-0.16	-0.19	-0.18	0.15	0.22	0.16	0.28	0.41	1.00						
18. Willingness	-0.33	-0.20	-0.20	-0.23	-0.20	-0.19	-0.47	-0.45	0.30	0.35	0.30	-0.13	-0.38	-0.16	-0.20	-0.30	-0.30	1.00					
19. Atti. Smok	-0.35	-0.27	-0.23	-0.35	-0.25	-0.26	-0.52	-0.47	0.31	0.38	0.30	-0.16	-0.40	-0.23	-0.22	-0.28	-0.29	0.59	1.00				
20. Atti. Drink	-0.33	-0.24	-0.23	-0.35	-0.22	-0.26	-0.50	-0.45	0.31	0.37	0.30	-0.17	-0.38	-0.26	-0.23	-0.30	-0.27	0.58	0.83	1.00			
21. Prototype	-0.34	-0.25	-0.22	-0.29	-0.24	-0.22	-0.51	-0.45	0.34	0.42	0.31	-0.21	-0.43	-0.29	-0.24	-0.31	-0.31	0.58	0.72	0.71	1.00		
22. Drinking beh.	-0.28	-0.21	-0.18	-0.25	-0.21	-0.24	-0.50	-0.46	0.32	0.32	0.30	-0.10	-0.35	-0.21	-0.19	-0.29	-0.28	0.78	0.54	0.58	0.55	1.00	
23. Smoking beh.	-0.31	-0.17	-0.16	-0.23	-0.22	-0.17	-0.46	-0.42	0.29	0.35	0.29	-0.12	-0.34	-0.16	-0.16	-0.22	-0.26	0.72	0.66	0.58	0.59	0.63	1.00
SD	0.64	0.62	0.69	0.56	0.62	0.78	0.70	0.81	0.90	0.91	0.94	0.73	0.74	0.78	0.18	1.00	0.57	0.88	0.72	0.70	1.00	1.00	1.00

Note. Aff. Invol. = affective involvement, Commu. = communication, Aff. Res. = affective response, Prob. = problem, Beh. Con. = behavior control, grat. = gratification, Per. = performance, Atti. = attitude, Beh. = behavior; $r > .08$, $p < .05$; $r > .109$, $p < .01$; $r > .124$, $p < .001$

control, protective factors, risk factors and substance use were specified as endogenous variables which have prior variables predicted.

For substance use, the criterion was a latent construct with two indicators, smoking and alcohol use⁴). An initial model was estimated with maximum-likelihood method for estimating the path coefficients. Modification indices were used for modifying model to be good fit to the data. For the final model, chi-square = 263.015, df=227, $p=.051$, comparative fit index (CFI) = .997, root mean square error of approximation (RMSEA) = .015 and all indices implied good fit to the data. The model was presented in Figure 1 with standardized coefficients. All variables in the model were accounted for 82% of the variance in student substance use.

The pathway was depicted in terms of three parts. Firstly, supportive parenting had path to good self-control but had no significant path to poor self-control and substance use, whereas family functioning had positive path to the good self-control and had negative path to the poor self-control but had no significant path to the substance use. This finding revealed that only family functioning had no direct effect on substance use, but supportive parenting had both direct and indirect effect on substance use in adolescence. Both constructs also had indirect effect through the self-control.

Secondly, good self-control had positive path to the protective factors and negative path to the risk factors whereas poor self-control had negative path to the protective factors and had positive path to the risk factors. This showed that both good self-control and poor self-control were the mediators in this model.

Finally, the risk factors had the strongest positive path to substance use, but the protective factors had no significance path to the substance use.

DISCUSSION: In the present study, a model of self-control, protective factors, risk factors were tested with theoretical support from western studies^{4,21}). In Thai context, the findings on family functioning had only significant pathway through mediators, good and poor self-control, and then to the protective and risk factors, but had no significant pathway to substance use directly. In addition to pathway for supportive parenting through self-control, the risk factors and the protective factors, the findings showed all effects on those variables, with positive effect on the protective factors and good self-control and negative effect on the risk factors and directly negative effect on substance use. These findings showed relations of proximal factor and distal factor concepts consistent with the ecological model⁹). Family and parenting processes were defined as proximal factors that were directly and

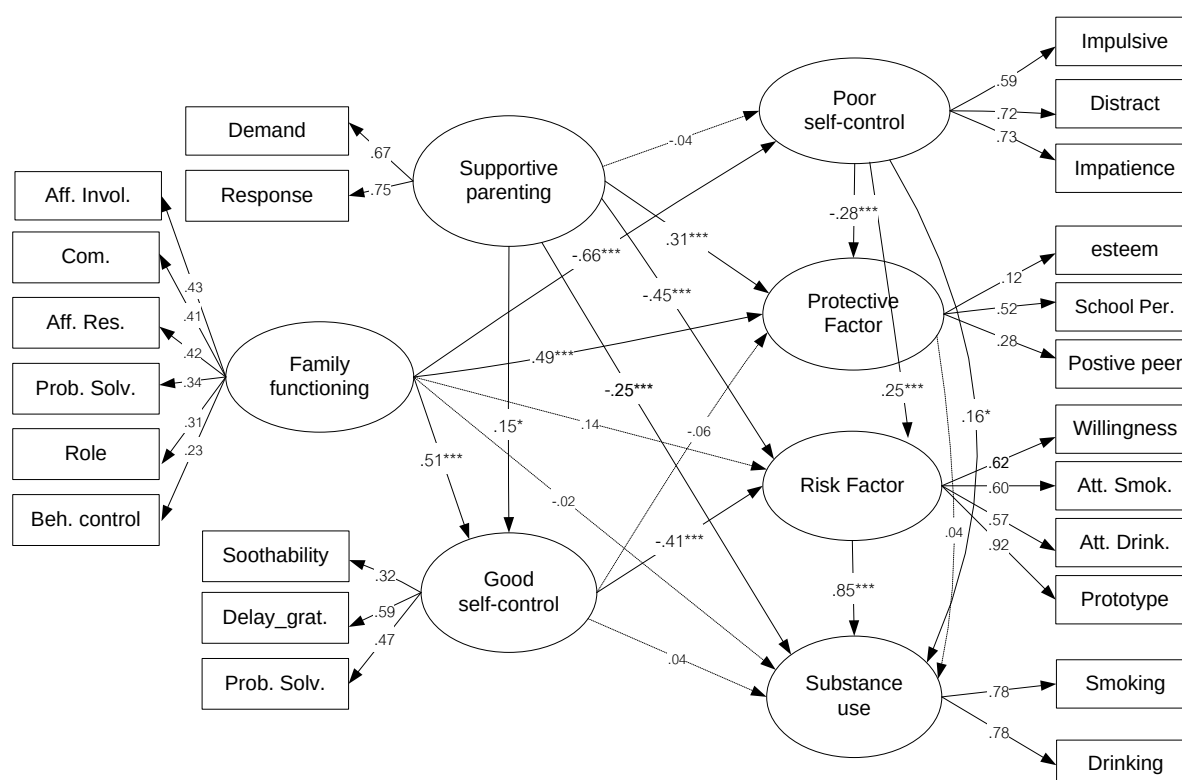


Figure 1 Structural equation model of adolescent substance use. Values are standardized coefficients. Aff. = affective, Invol= involvement, Com= communication, Res. = response, Prob.= problem, Solv. = solving, Beh. = behavior, grat. = gratification, Per. = performance, Att. = attitude. Chi-square= 285.77, df=227, $p=.051$; root mean square error of approximation (RMSEA) = .01; goodness of fit (GFI) = .97; adjusted goodness of fit index (AGFI) = .96; normed fit index (NFI) = .99 (* $p<.05$, ** $p<.01$, *** $p<.001$)

indirectly linked to children's competences, which could predict the smoking and drinking behavior in adolescents⁴. This finding indicated that those with perceived high supportive parenting were less likely to engage with substance use^{4,10,14}. This study also suggested that higher family functioning could reduce poor self-control and increase protective factors that were related to the smoking and drinking behavior in adolescents. These results were supported by previous researches in that dysfunctional family and lack of parental support strongly determined the tendency to experiment with smoking and other substance use¹⁰⁻¹³.

The results showed the strongest link between risk factors including willingness to substance use, attitude toward smoking and drinking in adolescence, and prototype. Both poor self-control and good self-control were directly linked to the risk factors. The good self-control construct had negative influence on the risk factors, whereas poor self-control had positively link to them⁴.

These findings were consistent with previous research⁴. Furthermore, good self-control had stronger contribution to the risk factors than poor self-control. Previous research suggested that self-control could forestall the risk factors⁴. The increase in poor self-control could accelerate individual risk factors; in contrast, high good self-control would reduce the individual risk factors. This finding showed the indirect influence of self-control on substance use through the risk factors, which were supported by plenty of western studies^{4,20,27}. Although previous researches had demonstrated that the protective factor was a bulker from substance use. In this present study, it was found that the protective factors had no direct effect on substance use. This result showed that self-control and the protective and risk factors were mediators. The results showed family functioning had significant positive effects on good self-control and also had significant negative effects on poor self-control. However, supportive parenting had only positive effects on good self-

control. Variables contributing to good self-control were consistent with previous research⁴⁾ and the theory about self-regulation²³⁾.

These findings suggested that prevention programs on students should include promoting good self-control as a source of protective factors for reducing the likelihood of engagement with substance use. Pathway of family functioning on substance use has been another important consideration and extension of prior research⁴⁾. The findings suggested that influence of family functioning on substance use had indirect way through poor self-control. Additionally, family functioning also had indirect way through good self-control before sending impact on the risk factors and finally on substance use. These findings demonstrated the connection of self-regulation concept with the problem behavior theory and social perception models^{4,18,38)}. The significant role of the risk factors including willingness to substance use, attitude toward smoking in adolescence, attitude toward drinking in adolescence and prototype of substance use emphasizes the rationale to include material concerning perception of non-users in prevention program as previous suggestion^{4,28)}. Implication for prevention should consider risk and protective behavior at different levels of adolescents' ecology⁹⁾. Additional efforts should focus on interaction of different microsystems such as parents, teachers, and peers²⁹⁾.

In summary, this study suggested the considerable influences of family functioning and supportive parenting on student substance use through mediators- self-control, protective factors, and risk factors. The significances of self-control and protective/risk factors were as the psychological mediators that associated with the family functioning and parenting to adolescent substance use. Among the theoretical models, this findings were consistent with the theoretical model⁴⁾ that emphasized on the importance of parenting and family process on self-control, then self-control on protective and risk factors as the prior link in the process that leads to substance use in adolescent students. The limitation of this study was that gender was not considered in the

model. The future study would be benefit from analyzing male and female students separately and comparing effects of each construct.

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