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*Chapter 47*

## **Substance abuse in junior secondary school students in Hong Kong: Prevalence and psychosocial correlates**

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### **Abstract**

Smoking, drinking and abuse of illicit drug behavior were examined in 3,328 Secondary 1 students in Hong Kong. Results showed that 5.8% and 28% of the respondents indicated that they had smoked and consumed alcohol in the past year, respectively. Some students had consumed organic solvent (2.1%), cough mixture (0.5%) and ketamine (0.4%) in the past year. Results showed that different measures of positive youth development and family functioning were related to adolescent substance abuse behavior. Generally speaking, higher levels of positive youth development and favorable family functioning were related to lower levels of substance abuse. The contribution of positive youth development and family factors to adolescent substance abuse is discussed.

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**Keywords:** substance abuse, Chinese adolescents, positive youth development, family functioning

## Introduction

Based on the findings reported in some of the major databases on adolescent development such as Monitoring the Future (MTF), *Youth Risk Behavior Surveillance (YRBS)* and *National Household Survey on Drug Abuse (NHSDA)*, adolescent substance abuse is a concern for policy makers and health professionals due to the rising of youth substance use (1). For example, from the results of the 2008 National Survey on Drug Use and Health, it was found that 9.3 percent of youths aged 12 to 17 were current illicit drug users (2).

The prevalence of substance use was not only found in North America and European countries, but also in Asian countries. With particular reference to Hong Kong, Shek (3) highlighted the following phenomena in substance abuse trend among adolescents in Hong Kong. First, there were two peaks in the number of substance abusers in the past decade. The first peak was in 1994 where the increase was due to abuse of tranquilizers and depressants. The second peak was in 2000 where the increase was related to the abuse of stimulants such as ecstasy and the rave party culture. Second, regarding the types of drugs abused, statistics show that psychotropic substances (particularly ketamine) were the major choice of abuse in recent years. Consistent with some recent research findings, cough medicine abuse was also rising. Third, regarding the reasons why young people in Hong Kong abuse drugs, peer influence and curiosity are two major reasons why young people abuse drugs. Shek (3) further outlined factors on different ecological levels which contribute to the rising adolescent substance abuse trend in Hong Kong. For example, on the personal level, research findings showed that several factors predispose adolescent substance abuse problem. These include curiosity, material affluence, "green house" upbringing process, lack of life meaning, and few systematic life skills and positive youth development programs in the formal curriculum in Hong Kong. Based on the ecological model, Shek (3) discussed the strategies to cope with adolescent substance abuse in Hong Kong. To date, however, there are no regular surveys of substance abuse among young people in Hong Kong except those school surveys conducted by the Narcotics Division of the Hong Kong Government of the Special Administrative Region in an irregular basis. Obviously, there is a need to examine the profiles of substance abuse in young people in Hong Kong.

Researchers and practitioners play an important role in helping young people from raising their awareness of the detrimental effect of drugs and developing positive psychological well-being. Effort in addressing the growing profile of drug abuse has been repeatedly emphasized at the national and international levels (4,5). Actually, scholars proposed prevention of substance abuse program should focus on building competence and resilience by adopting the positive youth development (PYD) approach to buffer against the risk of addictive behavior (6-8). In particular, identification of risk and protective factors is an important step in formulating strategies to combat the problem. However, the majority of the substance use studies were conducted in the western countries. Given the upsurge of the nonmedical psychotropic and illicit drug use has become a global public health issue, more research in

examining factors that work against youth substance use, especially in the Chinese context, is warranted.

There are two factors that are intimately related to adolescent problem behavior. First, positive youth development constructs are proposed to be related to adolescent problem behavior such as substance abuse. As adolescents having weak resilience, poor psychosocial competencies, blurred self-identity and low self-efficacy are likely to have poor developmental outcomes, there are theoretical accounts regarding the influence of positive youth development on mitigating adolescent problem behavior. Based on the concepts of protective factors in resilience literature, it can be conjectured that internal resources such as psychosocial competencies and external resources such as bonding (9) would protect individuals from life stresses, thereby minimizing the occurrence of problem behavior. There are researches showing that positive youth development was negatively related to problem behavior, such as substance abuse and delinquency. In North America, Catalano et al. (6) showed that around 96 percent of the 25 well-evaluated positive youth development programs reduced problem behavior; whereas in Hong Kong, Shek (10) found that positive youth development was negatively related to intention to engage in problem behavior among Chinese adolescents. Based on a large sample of Chinese adolescents in Hong Kong, there are research findings showing that positive youth development predicted adolescent problem behavior via life satisfaction (11).

Second, family processes also play an important role in adolescent problem behavior. There are research findings showing that weak parental monitoring and lack of parental warmth predicted adolescent substance abuse; poor family functioning was also conducive to adolescent problem behavior, including substance abuse (12,13). Furthermore, low parental monitoring and greater amount of time spent in unsupervised peer settings predicted higher risk of exposure to substance use among adolescents (14). In the local context, Shek (15) also showed that poor parenting and family dysfunction predicted adolescent problem behavior.

Unfortunately, a review of the literature shows that there are limited number of studies examining the relationships between positive youth development and family processes and adolescent substance abuse in the Chinese context. Against this background, the primary goals of the study were a) to explore the prevalence of substance use among Hong Kong adolescents, b) to assess the relationships between the positive youth development constructs and family functioning and adolescent substance abuse and c) to examine the predictive effects of positive youth development and family functioning on substance use utilizing cross-sectional data.

## **Methods**

The data were derived from the first wave of a six-year longitudinal study in assessing adolescents' development and their families in Hong Kong. A total of 3,328 Secondary 1 students (Grade 7) from 28 schools participated in this study. Among the participants, 1,731 (52%) were boys and 1,597 (48%) were girls. The mean age of the participants was 12.6 years old. The demographic information of the participants is shown in Table 1. During data collection, the purpose of the study was mentioned and confidentiality of the collected data was repeatedly emphasized to all students in attendance on the day of testing. Parental and

student consent had been obtained prior to data collection. All participants responded to all scales in the questionnaire in a self-administration format. Adequate time was provided for the participants to complete the questionnaire. A trained research assistant was present throughout the administration process.

**Table 1. Socio-demographic profiles of respondents (N=3,328)**

	n	%
Gender		
Male	1,731	52
Female	1,597	48
Place of birth		
Hong Kong	2,596	78
Mainland China	665	20
Others	67	2
School (N=28)		
District		
Hong Kong Island	5	18
Kowloon	7	25
New Territories	16	57
Parents' marital status		
Divorced	233	7
Separated	67	2
First marriage	2,796	84
Second marriage	133	4
Others	99	3
Receiving Financial aids		
No	2,629	79
Yes	233	7
Others	466	14

## Instruments

### *The Chinese Positive Youth Development Scale (CPYDS)*

The Chinese Positive Youth Development Scale (CPYDS, 16) was to assess positive youth development. The CPYDS has 15 subscales, including bonding (BO), resilience (RE), social competence (SC), recognition for positive behavior (PB), emotional competence (EC), cognitive competence (CC), behavioral competence (BC), moral competence (MC), self-determination (SD), self-efficacy (SE), clear and positive identity (SI), beliefs in the future (BF), prosocial involvement (PI), prosocial norms (PN) and spirituality (SP). The details of the items can be seen in Shek et al. (16). A 6-point Likert scale (1=strongly disagree to 6=strongly agree) was used to assess the responses of the participants. A composite score was calculated by averaging all item scores in order to obtain the mean of the overall positive youth development (CPYDS).

Using multigroup confirmatory factor analyses (MCFA), Shek and Ma (17) showed that the 15 basic dimensions of the CPYDS could be subsumed under four higher-order factors, including cognitive-behavioral competencies (CBC), prosocial attributes (PA), positive identity (PID) and general positive youth development qualities (GPYDQ). Evidence of

factorial invariance in terms of configuration, first-order factor loadings, second-order factor loadings, intercepts of measured variable, and intercepts of first-order latent factor, was found. In short, existing research findings showed that the CPYDS is a valid and reliable instrument.

### ***The Chinese Family Assessment Instrument (CFAI)***

The Chinese Family Assessment Instrument (CFAI) was used to assess family functioning. In the present study, three subscales, including mutuality (mutual support, love and concern among family members), communication (frequency and nature of interaction among family members), conflicts and harmony (presence of conflicts and harmonious behavior in the family) were examined. The five response options were “very similar,” “somewhat similar,” “neither similar nor dissimilar,” “somewhat dissimilar,” and “very dissimilar.” A higher total score on the subscales indicated a higher level of positive family functioning. A composite score was calculated by averaging all item scores in order to obtain the mean of the overall family functioning (CFAI). The reliability and validity of the CFAI were supported in previous studies (18-21). Furthermore, multigroup confirmatory factor analyses (MCFA) showed the existence of two higher order factors (i.e., family interaction and parenting) and factorial invariance of the CFAI across gender and subgroups (22).

### ***Substance use***

Eight items were used to assess the participants' frequency of using different types of substance (i.e., alcohol, tobacco, ketamine, cannabis, cough mixture, organic solvent, heroin, and pills such as ecstasy and methaqualone) during the last year. Participants answered on a 6-point Likert-scale (0 = never; 1 = 1-2 times; 2 = 3-5 times; 3 = more than 5 times; 4 = several times a month; 5 = several times a week; 6 = daily). A composite score was calculated by averaging all eight item scores in order to obtain the mean of the overall substance use. In addition, separate analyses were carried out by combining “smoking” and “drinking” as an indicator and aggregation of other illicit drugs as another indicator.

### ***Family background***

An item was asked to assess whether participants received financial aids (known as CSSA—comprehensive social security assistance) from the government of Hong Kong for financial needs. For example “*Your family is now receiving CSSA?*” (1=Yes, 0=No). Furthermore, participants' parents current marital status was asked (1=divorced, 2=separated, 3=first marriage, 4=second marriage; 5=others).

## **Results**

The prevalence of substance use among Hong Kong adolescents is shown in Table 2. Among the eight types of substance use, nearly 100% of adolescents reported they had never used psychotropic and illicit drugs over the past year. However, about six percent reported past year cigarette use. In addition, almost 28 percent reported they consumed alcohol during the past year.

**Table 2. Past year substance use among respondents**

	Occasionally				Often		
	Never	1-2 times (%)	3-5 times (%)	More than 5 times (%)	Several times a month (%)	Several times a week (%)	Daily (%)
Smoking	94.2	2.9	.9	1.1	.4	.3	.2
Drinking	72.0	14.6	4.9	6.1	1.9	.4	.1
Ketamine	99.6	.2	.1	.1	.0	.0	.0
Cannabis	99.9	.0	.1	.0	.0	.0	.0
Cough mixture	99.5	.3	.0	.2	.0	.0	.0
Organic solvent	97.9	1.4	.1	.4	.1	.1	.0
Pills*	99.9	.0	.0	.0	.1	.0	.0
Heroin	99.9	.0	.0	.0	.0	.0	.1

\*Pills: such as ecstasy and methaqualone

**Table 3. Correlations among variables in the model**

Overall Substance use	
Subscales based on primary-order factors	
BO	-.17
RE	-.11
SC	-.05
PB	-.16
EC	-.13
CC	-.08
BC	-.09
MC	-.14
SD	-.07
SE	-.06
SI	-.06
BF	-.12
PI	-.12
PN	-.19
SP	-.15
Subscales based on second-order factors	
CBC	-.10
PA	-.17
GPYDQ	-.17
PID	-.10
Subscales based on family functioning	
Mutuality	-.16
Harmony	-.14
Communication	-.18

Note. BO: bonding; RE: resilience; SC: social competence; PB: recognition for positive behavior; EC: emotional competence; CC: cognitive competence; BC: behavioral competence; MC: moral competence; SD: self-determination; SE: self-efficacy; SI: clear and positive identity; BF: beliefs in the future; PI: prosocial involvement; PN: prosocial norms; SP: spirituality; CBC: cognitive-behavioral competencies second-order factor; PA: prosocial attributes second-order factor; GPYDQ: general positive youth development qualities second-order factor; PID: positive identity second-order factor. All correlations are significant ( $p < .01$ ).

Analyses based on Pearson correlation showed that all positive youth development and family functioning measures were negatively correlated (ranging from -.05 to -.19) with the overall substance use. In general, higher levels of positive youth development and family functioning were related to a lower engagement level of substance use (Table 3). These findings are consistent with the expectations of the study.

To examine the relative contribution of different aspects of positive youth development to adolescent substance use, multiple regression analyses were performed with positive youth development measures as the predictors and different measures of substance use as the criterion variables. The findings based on multiple regression analyses can be seen in Table 4.

**Table 4. Regression analyses based on the positive youth development constructs and family functioning dimensions**

Predictor	Overall Substance use			Smoking & Drinking			Other Substance use <sup>#</sup>		
	R	R <sup>2</sup>	$\beta^a$	R	R <sup>2</sup>	$\beta^a$	R	R <sup>2</sup>	$\beta^a$
Subscales based on primary-order factors									
BO			-.07*			-.09**			
RE									
SC			.11**			.09**			.07*
PB			-.07**			-.09**			
EC			-.13**			-.13**			-.08*
CC			.11**			-.08*			
BC									
MC			-.07**			-.09**			
SD									
SE									
SI			.13**			.11**			
BF			-.07*			-.08*			
PI						.06*			-.07*
PN			-.11**			-.12**			-.08**
SP			-.09**			-.10**			
Model	.29	.08		.29	.08		.15	.02	
Subscales based on second-order factors									
CBC			.14**			.13**			.09**
PA			-.12**			-.10**			-.08*
GPYDQ			-.27**			-.27**			-.11**
PID			.08**			.08*			
Model	.23	.05		.22	.05		.12	.01	
Subscales based on family functioning									
Mutuality									
Harmony			-.07**			-.10**			
Communication			-.11**			-.11**			
Model	.19	.04		.20	.04				

Note. BO: bonding; RE: resilience; SC: social competence; PB: recognition for positive behavior; EC: emotional competence; CC: cognitive competence; BC: behavioral competence; MC: moral competence; SD: self-determination; SE: self-efficacy; SI: clear and positive identity; BF: beliefs in the future; PI: prosocial involvement; PN: prosocial norms; SP: spirituality; CBC: cognitive-behavioral competencies second-order factor; PA: prosocial attributes second-order factor; GPYDQ: general positive youth development qualities second-order factor; PID: positive identity second-order factor.

<sup>#</sup>Ketamine, cannabis, cough mixture, organic solvent, pills and heroin.

<sup>a</sup>Standardized coefficients

\* $p < .05$ , \*\* $p < .01$

Results showed that bonding (BO), recognition for positive behavior (PB), emotional competence (EC), moral competence (MC), beliefs in the future (BF), prosocial norms (PN), spirituality (SP), general positive youth development qualities second-order factor (GPYDS) and prosocial attributes second-order factor (PA) negatively predicted overall substance use. However, it is noteworthy that social competence (SC), cognitive competence (CC), clear and positive identity (SI), cognitive-behavioral second-order factor (CBC) and positive identity second-order factor (PID) positively predicted past year overall substance use.

Additional analyses were carried out to examine the influence of different aspects of family functioning to adolescent substance abuse. Consistent with the results of the positive youth development constructs, all family functioning dimensions, except mutuality, were negatively related to substance use (Table 4). However, these relationships were not shown in predicting illicit drug use. In other words, favorable family functioning was associated with lower likelihood of substance use. Furthermore, respondents whose parents were remarried were likely to have a higher level of overall substance use (Table 5). Overall speaking, both positive youth development and family functioning negatively predicted adolescent substance abuse.

**Table 5. Regression analyses based on the positive youth development constructs and family background**

Predictor	Substance use		
	R	R <sup>2</sup>	$\beta^a$
CPYDS			-.10**
CFAI			-.15**
Marital status			
Divorced			
Separated			
First marriage <sup>#</sup>			
Second marriage			.05*
Financial aids			
CSSA <sup>^</sup>			
Model	.23	.05	

Note. Financial aids (Yes=1; No=0). CPYDS=average mean score of all items from the Chinese Positive Youth Development Scale; CFAI=average mean score of all items from the Chinese Family Assessment Instrument.

<sup>^</sup>CSSA: comprehensive social security assistance

<sup>a</sup>Standardized coefficients

<sup>#</sup>as reference group

\*p < .05, \*\*p < .01

## Discussion

The goal of the current study was to examine the prevalence and psychosocial correlates of substance use among Chinese adolescents in Hong Kong. There are several unique characteristics of the present study. First, in view of the paucity of research in different Chinese contexts, Chinese adolescents were recruited. Second, a large sample size was

employed to give a more general picture of the problem. Finally, two validated measures of positive youth development and family functioning in the Chinese contexts were used. This study is a positive response to the scarcity of substance use research in different Chinese contexts. It provides insights into the adolescents' involvement in overall substance use and design of appropriate prevention strategies for Chinese young people.

In the present study, the rates of substance use among Hong Kong adolescents are generally lower than those found in North America (23,24) and European countries (25). Among the types of substance use, drinking alcohol was the most popular activity, followed by smoking cigarette and using drugs is the least popular. These findings are in line with previous studies based on a sample of Hong Kong adolescents with similar demographic background (26-28).

Although the rates of drinking and smoking remain low as compared to the findings in the West, the steady trend in substance use deserves our attention due to the inter-correlated nature of problem behaviors (29,30). This is further supported by a recent survey based on a sample of Hong Kong primary and secondary students. Lau and Kan (26) found that individuals who smoked and drank were likely to engage in other risk and problem behaviors (e.g., truancy, runaway, gang involvement, sexual activity, gambling), and these associations were particularly strong for smoking. As early onset of substance use is linked to later problem behaviors and chronic drug abuse (31,32), early identification and prevention of substance use among Hong Kong adolescents is needed.

The findings of this study reinforce the notion that higher level of positive youth development qualities would predict lower level of youth risk behaviors (6,33). The associations between the positive youth development qualities and substance use support the notion that building adolescents' competencies and providing an atmosphere that emphasizing the negative attitude towards substance use would reduce the abuse of alcohol, tobacco, and other drugs (34). Interestingly, several positive youth development constructs (i.e., social competence, cognitive competence, clear and positive identity, cognitive-behavioral competencies second-order factor, positive identity second-order factor) positively predicted substance use. This might be related to the popularity of recreational drug use among Hong Kong adolescents. Data from the Narcotics Division showed that the change of drug use location from public setting, such as disco and Karaoke (41% in 2007 and 34% in 2008) to private settings, such as friends' home, park and public toilet (60% in 2007 and 68% in 2008) among youths under aged 21 (35). Another possible explanation is that for those who are socially and cognitively more mature may over-estimate their abilities and thus are tempted to try substances.

Adolescents have a higher chance for engaging in risk-taking behavior than other age-groups under the influence of peer pressure (36,37). According to problem behavior theory (38), the likelihood of engaging in health-risky behavior would depend on the exposure of risk and protective factors, such as unhealthy models from the significant others, exposure to risk opportunity, and individuals' personal characteristics. This is supported by Graham et al. (39) who found that "*explicit offers to try alcohol*", "*social modeling*" and "*overestimation of friends alcohol use*" were significantly related to adolescents' future substance use, regardless of gender. Perhaps, adolescents are likely to engage in substance use as a way of seeking identification under the peer influence. More research in this area is needed in the future to better understand the factors associated with Chinese adolescents substance use. It is

noteworthy that the predictive effects of these positive youth development qualities on substance were generally low.

One of the uniqueness of the present study is the consideration of factors pertaining to adolescents' family background. The role of family structure and family relations on youth problem behaviors are well established (41-43). In line with previous studies, the likelihood of substance use was higher among adolescents from non-intact families than those from intact families (44,45). In particular, this study reinforces existing research that negative and hostile family relationships were associated with increased levels of individual violence and delinquency (42). This indicates the importance of considering family variables in studying youth substance use.

Despite the above findings, limitations of the present study should be noted. First, as it did not include the influence of peer, it would be interesting to investigate how social process interacts with different positive youth development constructs and its impact on individuals' behavior outcomes. Second, future research in examining the longitudinal effect of the positive youth development qualities on substance use could advance the understanding of the trajectories of adolescents' psychological development and problem behaviors. This is supported by recent longitudinal findings which showed that positive youth development programs such as the Project P.A.T.H.S. can help to promote youth development and reduce their negative behavior among Hong Kong adolescents (46,47).

The present study can help us design prevention substance use programs among youths. As noted by Lilja et al. (48), "Substance use is increasing in many countries...cultural context variables can be collected to enable a clearer understanding of how the environment influences the effects of a prevention program...so that we are able to 'match' a prevention program to different cultural conditions, dimensions, and their unique 'demands' (p. 335)". Clearly, our findings appear to be a positive response to this request. The present study sheds light on developing more effective prevention of substance use program among Hong Kong adolescents.

## References

- [1] Johnston LD, O'Malley PM, Bachman JG, Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975-2008. Volume I: Secondary school students (NIH Publication No. 09-7402). Bethesda, MD: Natl Inst Drug Abuse, 2009.
- [2] Office of Applied Studies, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services. Results from the 2008 National Survey on Drug Use and Health: national findings. Assessed 2010 Dec 15. URL: <http://www.oas.samhsa.gov/nsduh/2k8nsduh/2k8Results.cfm#2.2>
- [3] Shek DTL. Tackling adolescent substance abuse in Hong Kong: where we should go and should not go? *ScientificWorldJournal* 2007;7:2021-30.
- [4] Gruskin S, Plafker K, Smith-Estelle A. Understanding and responding to youth substance use: the contribution of a health and human rights framework. *Am J Pub Health* 2001;91(12): 1954-63.
- [5] United Nations Office on Drugs and Crimes. Prevention of the Recreational and Leisure Use of Drugs among Young People. (2002). Assessed 2010 Dec 15. URL: [http://www.unodc.org/youthnet/youthnet\\_youth\\_drugs.html](http://www.unodc.org/youthnet/youthnet_youth_drugs.html)
- [6] Catalano RF, Berglund ML, Ryan J AM, Lonczak HS, Hawkins JD. Positive youth development in the United States: research findings on evaluations of positive youth development programs. *Prev Treat* 2002;5:15.

- [7] Rich GJ. The positive psychology of youth and adolescence. *J Youth Adolesc* 2003;32(1):1-3.
- [8] Seligman MEP, Csikszentmihalyi M. Positive Psychology. *Am Psychol* 2000;55(1):5-14.
- [9] Jessor R, Turbin MS, Costa FM, Dong Q, Zhang H, Wang C. Adolescent problem behavior in China and the United States: a cross-national study of psychosocial protective factors. *J Res Adolesc* 2003;13(3):329-60.
- [10] Shek DTL. Positive youth development and behavioral intention to gamble among Chinese adolescents in Hong Kong. *Int J Adolesc Med Health* 2010;21(1):163-72.
- [11] Sun RCF, Shek DTL. Life satisfaction, positive youth development, and problem behaviour among Chinese adolescents in Hong Kong. *Soc Indic Res* 2010;95:455-74.
- [12] Rosenblum A, Magura S, Fong C, Cleland C, Norwood C, Casella D, Truell J, Curry P. Substance use among young adolescents in HIV-affected families: resiliency, peer deviance, and family functioning. *Subs Use Misuse* 2005;40(5):581-603.
- [13] Wagner KD, Ritt-Olson A, Chou CP, Pokhrel P, Duan L, Baezconde-Garbanati L, Soto DW, Unger JB. Associations between family structure, family functioning, and substance use among Hispanic/Latino adolescents. *Psychol Addict Behav* 2010;24(1):98-108.
- [14] Chilcoat HD, Anthony JC. Impact of parent monitoring on initiation of drug use through late childhood. *J Am Acad Child Adolesc Psych* 1996;35(1):91-100.
- [15] Shek DTL. Family functioning and psychological well-being, school adjustment, and substance abuse in Chinese adolescents: are findings based on multiple studies consistent? In: Shohov SP, ed. *Advances in psychology research*. New York: Nova Science, 2003:163-84.
- [16] Shek DTL, Siu AMH, Lee TY. The Chinese Positive Youth Development Scale: a validation study. *Res Soc Work Pract* 2007;12(3):380-91.
- [17] Shek DTL, Ma CMS. Dimensionality of the Chinese Positive Youth Development Scale: confirmatory factor analyses. *Soc Indic Res* 2010;98:41-59.
- [18] Shek DTL. Assessment of family functioning: the Chinese version of the Family Assessment Device. *Res Soc Work Pract* 2002;12:502-24.
- [19] Shek DTL. Assessment of family functioning Chinese adolescents: the Chinese Family Assessment Instrument. In: Singh NN, Ollen-dick T, Singh AN, eds. *International perspectives on child and adolescent mental health*. Amsterdam: Elsevier, 2002:297-316.
- [20] Siu AMH, Shek DTL. Psychometric properties of the Chinese Family Assessment Instrument in Chinese adolescents in Hong Kong. *Adolesc* 2005;40:817-30.
- [21] Shek DTL. Family functioning and psychological well-being, school adjustment, and substance abuse in Chinese adolescents: are findings based on multiple studies consistent? In: Shohov SP, ed. *Advances in psychology research*. New York: Nova Science, 2003:163-84.
- [22] Shek DTL, Ma CMS. The Chinese Family Assessment Instrument (C-FAI): hierarchical confirmatory factor analyses and factorial invariance. *Res Soc Work Pract* 2010;20(1):112-23.
- [23] Substance Abuse and Mental Health Services Administration, Office of Applied Studies. The National Household Survey on Drug Abuse Report (NHSDA): comparison of substance use in Australia and the United States. 2003. United States Department of Health & Human Services, Rockville, MD. Assessed 2010 Dec 15. URL: <http://oas.samhsa.gov/2k3/Australia/Australia.cfm>
- [24] Substance Abuse and Mental Health Services Administration, Office of Applied Studies. Results from the 2007 National Survey on Drug Use and Health: national findings. (2008). United States Department of Health & Human Services, Rockville, MD. Assessed 2010 Dec 15. URL: <http://oas.samhsa.gov/nsduh/2k7nsduh/2k7results.cfm>
- [25] Sigfusdottir ID, Kristjansson AL, Thorlindsson T, Allegrante JP. Trends in prevalence of substance use among Icelandic adolescents, 1995-2006. *Subst Abuse Treat Prev Policy* 2008;3:12-20.
- [26] Lau M, Kan MY. Prevalence and correlates of problem behaviors among adolescents in Hong Kong. *Asia-Paci J Pub Health* 2010;22(3):354-64.
- [27] Lee A, Tsang CKK. Youth risk behavior in a Chinese population: a territory-wide youth risk behavioral surveillance in Hong Kong. *Pub Health* 2003;118:88-95.
- [28] Lee A, Tsang CKK, Lee SH, To CY. A YRBS survey of youth risk behaviors at alternative high schools and mainstream high schools in Hong Kong. *J Sch Health* 2001;71(9):443-47.

- [29] Jessor S, Jessor R. Problem behavior and psychological development: a longitudinal study of youth. New York: Academic Press, 1977.
- [30] Lam TH, Stewart SM, Ho LM. Smoking and high-risk sexual behavior among young adults in Hong Kong. *J Behav Med* 2001;24(5):503-18.
- [31] Jackson C, Henriksen L, Dickinson D, Levine DW. The early use of alcohol and tobacco: its relation to children's competence and parents' behavior. *Am J Pub Health* 1997;87:359-64.
- [32] Kaplow JB, Curran PJ, Dodge KA, The Conduct Problems Prevention Research Group. Child, parent, and peer predictors of early-onset substance use: a multisite longitudinal study. *J Abnorm Child Psychol* 2002;30(3):199-216.
- [33] Gavin LE, Catalano RF, David-Ferdon C, Gloppen KM, Markham CM. A review of positive youth development programs that promote adolescent sexual and reproductive health. *J Adolesc Health* 2010;46:S75-91.
- [34] Jessor R, Van Den Bos J, Vanderryn J, Costan FM, Turbin MS. Protective factors in adolescent problem behavior: moderator effects and developmental change. *Develop Psychol* 1995;31:923-33.
- [35] Narcotics Division. Central registry of drug abuse: fifty-eight report (1999-2008). Hong Kong: Narcotics Division, Government Secretariat, Government of Hong Kong SAR, 2009.
- [36] Dahl RE. Adolescent brain development: a period of vulnerabilities and opportunities. *Ann New York Acad Sci* 2004;1021:1-22.
- [37] Spear LP. The adolescent brain and age-related behavioral manifestations. *Neurosci Biobehav Rev* 2000;24:417-63.
- [38] Jessor R, Donovan JE, Costa FM. Beyond adolescence: problem behavior and young adult development. New York: Cambridge Univ Press, 1991.
- [39] Graham J, Marks G, Hansen W. Social influence processes affecting adolescent substance use. *J Appl Psych* 1991;16(2):291-98.
- [40] Eiden RD, Colder C, Edwards EP, Leonard KE. A longitudinal study of social competence among children of alcoholic and nonalcoholic parents: role of parental psychopathology, parental warmth, and self-regulation. *Psychol Addic Behav* 2009;23(1):36-46.
- [41] Graham N. The influence of predictors on adolescents drug use: an examination of individual effects. *Youth Soc* 1996;28(2):215-35.
- [42] Henry DB, Tolan PH, Gorman-Smith, D. Longitudinal family and peer group effects on violence and nonviolent delinquency. *J Clin Child Psychol* 2001;30(1):172-86.
- [43] Wells LE, Rankin JH. Families and delinquency: a meta-analysis of the impact of broken homes. *Soc Problems* 1991;38(1):71-93.
- [44] Barnes GM. Impact of the family in adolescent drinking patterns. In: Collins RL, Leonard K E, Searles JS, eds. *Alcohol and the family: research and clinical perspectives*. New York: Guilford, 1990.
- [45] Haffmann JP, Johnson RA. A national portrait of family structure and adolescent drug use. *J Marriage Fam* 1998;60:633-45.
- [46] Shek DTL, Ma CMS. Impact of the Project P.A.T.H.S. in the junior secondary school years: individual growth curve analyses. *ScientificWorldJournal* 2011;11:253-66.
- [47] Shek DTL, Yu L. Prevention of adolescent problem behavior: longitudinal impact of the Project P.A.T.H.S. in Hong Kong. *ScientificWorldJournal* 2011;11:546-67..
- [48] Lilja J, Giota J, Hamilton D, Larsson S. An example of international drug politics: the development and distribution of substance prevention programs directed at adolescents. *Subst Use Misuse* 2007;42:317-42.