

Final Report

Study on Drug Abuse Situation and Service Needs of Non-engaged Youths in Hong Kong

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Introduction

Prevalence of substance use among adolescents and youths

Substance use among adolescents and youths is a global health problem. In the U.S., one study of a nationally representative sample of 10,123 adolescents showed that 9.6% of those aged 13-14 years and 42.5% of those aged 17-18 years reported life time illicit drug use (Swendsen et al., 2012). In Europe, lifetime illicit drug use was 17% among adolescents aged 15-16 in Iceland (Sigfusdottir, Kristjansson, Thorlindsson, & Allegrante, 2008), and lifetime cannabis use was 34.4% and 32.2% among male and female aged 16-18 respectively in France (Melchoir, Chastang, Goldberg, & Fombonne, 2008). In China, lifetime marijuana use was 1.7% among 12-19 years old students in Guangzhou (Wang, Deng, Wang, Wang, & Xu, 2009), and illicit drug use in the preceding year was 6.4% among 16-18 years old student in Taiwan (Yang, Yang, Liu, & Ko, 1998). In Hong Kong, the prevalence of ever use of psychoactive substances among secondary school students was estimated to be 3.3% in the 2004/05 school year and 4.3% in the 2008/09 school year (Narcotic Division, 2010a). Another important concern is the lowering of the age of onset for using psychoactive substances, ranging from 13 to 21 years old in the U.S. (Grant & Dawson, 1998; Vega et al., 2002). In Hong Kong, 28.3% of the youths used psychoactive substances for the first time when they were between 13 to 14 years old (Hong Kong Legislative Council Secretariat, 2009).

In the U.S., the commonly used psychoactive substances include marijuana, vicodine, amphetamine and cough syrup (National Institute of Drug Abuse [NIDA], 2011). In Hong Kong, the psychoactive substances most commonly used by youths under age 21 include ketamine, methylamphetamine, cocaine and cannabis (Narcotics Division, 2012).

Harms caused by psychoactive substance use among adolescents and youths

The harms of psychoactive substance use have been well documented (Kraner, McCoy, Evans, Evans, & Sweeney, 2001; Maisto, Galizio, & Connors, 1999; Mittleman, Lewis, Maclure, Sherwood, & Muller, 2001; National Institute of Drug Abuse, 2012). Psychologically, long-term use of psychoactive substances causes insomnia, depression, anxiety, and psychotic symptoms. Physically, short-term use causes increase in blood pressure, loss of appetite and sweating, while long-term use increases the risks of heart attack, lung infection, dental problems, kidney and liver failure and severe weight loss. Cognitively, short-term use causes judgment impairment, while long-term use is detrimental to short-term memory. Prevention efforts are greatly warranted.

Factors associated with psychoactive substance use among adolescents and youths

These factors include: socio-demographic factors such as single parent family (Wang, Simons-Morton,

Farhart & Luk, 2009), mental health problems such as social isolation, depression, anxiety and stress (Dinges & Duong-Tran, 1992), childhood experience in school suspension (Evans-Whipp, et al., 2004), physical maltreatment (Lau, Kim, Tsui, Cheung, et al., 2005), corporal punishments (Straus & Kantor, 1994), and peer influences (Wang et al., 2009). Furthermore, factors derived from cognitive behavioral models, such as the Health Belief Model (HBM) and the Theory of Planned Behaviors (TPB) have found to be significantly associated with the use of psychoactive substances (Moore & Gullone, 1996; Lac, Alvaro, Crano, & Siegel, 2009) and cessation of substance use (Sargent, Mott, & Stevens, 1998) among adolescents. Constructs of HBM include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action and perceived self-efficacy (Rosenstock, Strecher, & Becker, 1994), while TPB specifies that attitudes, subjective norms and perceived behavioral control determine behavioral intention, which in turn determines the actual behavior (Ajzen, 1985).

It is equally important to consider protective factors such as social and family support (Wills, Resko, Ainette, & Mendoza, 2004). Resilience, a relatively new concept in positive psychology, is defined as the ability to recover from adversity (Wolff, 1995). It has found to be a protective factor against substance use (Hodder et al., 2011). Resilience is associated with attributes such as self-esteem, competence, optimism and sense of belonging (Ebersohn & Maree, 2006). Furthermore, previous studies have documented effectiveness of media campaigns on prevention of substance use among adolescents (Carpenter & Pechmann, 2011). Some of these campaigns were based on the fear appeal approach (Dejong & Wallack, 1999). Determinants of psychoactive substance use among adolescents and youths are hence multi-dimensional. A comprehensive analysis was conducted in this study.

Non-engaged youths (NEY) as a high risk group for psychoactive substance use

It is warranted to investigate the associations between the aforementioned factors and psychoactive substance use among NEY. This special subgroup of adolescents and youths are prone to substance use as drop-out from school is strongly associated with substance use (Bond et al., 2007; Henry, Knight, & Thornberry, 2012; Townsend, Flisher & King, 2007). This is expected as drop-out from schools is associated with lower socio-economic status, family problems (Henry, Cavanagh, & Oetting, 2011), low motivation (Vallerand, Fortier, & Guay, 1997), poor self-esteem (Herrenkohl, Herrenkohl, Egolf, & Russo, 1998), poor psychological health (Ensminger, Hanson, Riley, & Juon, 2003), affiliation with substance users (McCaffrey, Pacula, Han, & Ellickson, 2010), behavioral problems (Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006), experience of child abuse (Herrenkohl et al., 1998), and single parenthood (Legleye, Obradovic, Janssen, Spilka, Nezet, & Beck, 2009). Most of these aforementioned factors have been shown to be associated with substance use among adolescents and youths (Legleye et al., 2009; Swaim, Bates, & Chavez, 1998; Kogan, Luo, Brody, & Murry, 2005; Barrett & Turner, 2006).

Besides dropping out from schools, non-engagement includes the element of unemployment, which is also strongly associated with substance use (Fergusson, Horwood & Lynskey, 1997; Suvisaari et al.,

2009). According to the World Health Organization (2009), adolescence is defined as those of age 10 to 19 years old and youth refers to those of age 15 to 24 years old. In these age groups, the unemployment rates are very high. In the U.S., it was 16.4% (International Labor Organization, 2012). In Hong Kong, the trend of youth unemployment is shown in Figure 1 (Index Mundi, 2011). Locally, non-engagement was shown to be associated with problems such as learning disability, mood disorder, and anxiety (Cheng-Lai & Dorcas, 2011). That study however, did not look at factors associated with substance use among NEY.

In Hong Kong, despite the relatively low prevalence of psychoactive substance use among secondary school children, the prevalence of psychoactive substance use among NEY, young people of age 15-24 years old who are not employed and are unable to pursue further studies for a prolonged period of time (Shek & Lee, 2004), was high. According to a report previously prepared by our group (Lau, 2003), the prevalence of psychoactive substance use among NEY aged 15 to 19 recruited from outreach services, the Youth Work Experience Training Scheme, and the Youth Pre-employment Training Programme was 8% in 2002. As the problems faced by NEY are different from those faced by engaged youths, different anti-drug strategies are required. Segmentation is an important concept in social marketing (Center for Disease Control, 2012); programs focusing on particular strategic homogeneous segments have found to be effective (Thackeray, Keller, Heilbronner, & Dellinger, 2011). The Hong Kong government has recently invested ample resources on prevention and control of psychoactive substance use among adolescents and youths. As there is a dearth of studies on issues related to use of psychoactive substances among NEY, the Narcotic Division commissioned this needs assessment study to the Centre for Health Behaviors Research of the Chinese University of Hong Kong.

Objectives of this study

1. to identify socio-demographic profiles, behaviours and characteristics of non-engaged youth in general, with special focus on drug abusers;
2. to investigate the risk and protective factors on the drug taking behaviours of non-engaged youth;
3. to examine the service needs of these non-engaged drug abusing youth and barriers that discourage them from receiving anti-drug services;
4. to recommend services that may help non-engaged drug abusing youth to resume a healthy life.

The first part of the study targeted all participants. It investigated the prevalence of use of psychoactive substances (life-time use, use during the last year and intention to use in the next 12 months) among Chinese NEY (definition comes later) of 15 to 24 years old in Hong Kong. We investigated factors associated with ever use of psychoactive substances (among all participants), intention to use psychoactive substances in the next 12 months (among those who had never used psychoactive substances) and intention not to use psychoactive substances (among those who had used psychoactive

substances in the last 12 months) in the next 12 months. Examples of psychoactive substances, including ketamine, methylamphetamine, cocaine, cannabis, ecstasy, nimetazepam, flunitrazepam, and coughing syrup, were provided to the participants.

In the first part of the study, a wide range of factors was considered for investigating associations with ever use of psychoactive substances, including 1) socio-demographic factors, 2) information related to non-engagement (duration, distress, desire to be employed, participation in community activities, perceived governmental support on youth development), 3) previous adversities (physical abuse and corporal punishment, arrest, and school suspension), 4) cognitive factors related to psychoactive substance use, basing on HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action and perceived self-efficacy), 5) protective factors (resilience attributes, social and family support), 6) mental health status (loneliness and social isolation, depression, anxiety and stress), 7) responses to the themes of announcements of public interest (API) and anti-drug slogans (level of fear induced and perceived impact on the participant's substance use behavior) and 8) peer influences on substance use (friends who are substance users and suggestion by peers to use substance).

While the first part of the study focused on all participants, the second part targeted psychoactive substance users (those who had used psychoactive substances in the last 12 months) only. The second part of the study described their profile, and the history (age at first use) and patterns of substance use (e.g. types and frequency of substance use, multiple drug use, substance use in mainland China, and performance of illegal activities due to substance use). Second, the levels of awareness and utilization of cessation services, intention to use psychoactive substances in the next year, and history of relapse was reported. Third, some cognitive beliefs on cessation basing on TPB (positive and negative attitudes, subjective norms and perceived behavioral control) were assessed. Fourth, the level of help seeking behaviors to deal with problems related to substance use was recorded. Lastly, factors associated with intention of not to use substances in the next 12 months within this subgroup of participants were investigated.

Subjects and methods

The study population

In this study, NEY was operationally defined as Hong Kong adolescents and youths of 15 to 24 years old, having neither been schooled nor employed in the past three months at the time of the interview being conducted

Study design

A cross-sectional survey was conducted from February 2011 to March 2012. The main data set was collected from a random population-based telephone survey on NEY aged 18 to 24 (n=255) years old. As some NEY could not be accessed via fix-line phones, supplementary data were collected on a special subgroup of NEY who were clients of social workers (n=209) plus some referrals of NEY aged 15 to 24 made by NEY participants of this study who were clients of social workers (n=15). The total sample size was hence 479. The multiple sample methods also allow us to cover those served and not served by social workers. Allowing for potential limitations that the telephone survey may not be able to cover NEY who could not be reached by phone, the prevalence estimated by the main telephone survey sample was an effort to reflect the overall situation of NEY in Hong Kong. However we made no attempt to compare the estimated prevalence to those obtained in previous studies as the methodologies used were different. The sample of clients of social workers represented a potentially important subgroup as potential interventions can be delivered to such NEY via social workers. Since the special subgroup had a different age range and different characteristics as compared to the overall telephone sample, we presented the prevalence of the two groups separately. We also presented figures for the overall sample for completeness but such information should only be used for reference only.

Ethics approval for the study was obtained from the Survey Research Ethics Committee of the Chinese University of Hong Kong.

Sampling NEY aged 18 to 24 through a telephone survey

A population-based telephone survey was conducted to recruit eligible participants aged 18 to 24 from the community. As parental consent was required for adolescents below 18 and obtaining such was not possible in a telephone survey, only adolescents aged 18 to 24 were targeted in the present study. Telephone surveys have been commonly used in local surveys (Lau, Kim, Lau, Tsui, 2004; Lau & Tsui, 2003) and it is suggested that telephone surveys are more appropriate than other survey methods in collecting sensitive data, as embarrassment and social desirability can be reduced (Marcus & Crane, 1986). Telephone numbers were selected randomly from up-to-date telephone directories. Telephone calls were both made during the daytime and the evening. If the household could not be reached, at least three calls were made at different hours and different days of the week before classifying the selected telephone numbers to be an invalid number. The person who answered the phone served as an initial contact person. This person was asked whether there were household members of 18 to 24 years old. When there was more than one eligible member in a household, the one whose birthday was the closest to the interview date was selected. The interviewers were connected to such household member. The interviewers confirmed eligibility of these youths and invited the eligible ones to join the study. Verbal informed consent was obtained before the interview commenced.

A total of 194,559 calls were made and 92,077 households responded. A total of 8,568 responded households contained at least one member aged 18 to 24 and among them, a total of 301 eligible NEY

were identified, 255 (84.7%) of whom completed the telephone interview. The percentage of household with NEY, based on the sample from the current telephone survey, was 3.51% (301/8,568x100%). As it was not our purpose to estimate prevalence of NEY in Hong Kong or to compare the figure with the previous studies on NEY, we did not record the total number of members of age 18 to 24 years old in the household. Hence, the prevalence of NEY cannot be calculated from our data. However, since we know that some households may have more than one NEY, we can interpret the figure of 3.51% as the lower bound of the prevalence of NEY, which can be obtained by dividing this figure by the average number of household members who were of 18 to 24 years old.

Sampling NEY aged 15 to 19 who are clients of social workers

Such sampling was facilitated by a number of social services agencies. Only NEY aged 15 to 19 were included as we were informed by the collaborating social workers that the majority of their clients (over 90%) were of age below 20. The age range was decided in a meeting with the social workers taking into account the low number of participants expected among those clients older than 20 years old and practical concern of their relatively low willingness to participate in this study. A total of 39 agencies had been approached and 18 of which agreed to participate in this study (Appendix 1). Several meetings were held to brief the social workers about the sampling procedures. To increase randomness, each agency was requested to list the number of their outreached clients fulfilling the inclusion criteria and to select a maximum of 20 of their clients from the list by using a random number table provided by the researchers. Social workers of the participating agencies briefed the sampled prospective participants about the study and referred them to contact the research team. Our field supervisors then met with the prospective participants by appointment at the center of the participating social work agencies. Participants were briefed again and written informed consent was obtained before the anonymous face-to-face interview was administered by our field supervisors in a private room, and in the absence of any third person. The same questionnaire that was used in the telephone survey was used to interview this subgroup of NEY. Participants were assured about data confidentiality and that the information obtained from the participants would not be disclosed to the social workers, nor to any other person, and will be used for research purpose only. Participants were given a supermarket coupon of HK\$50 value upon completion of the questionnaire for their time spent in the interview (about 30 minutes). A total of 209 eligible participants were referred to the research team; all of them provided written consent to join the study and completed the face-to-face interview.

Sampling NEY through snow-balling

Participants recruited from social service agencies were invited to nominate their peers, who were currently non-engaged youths but were not being served by any social service agency to join this study. An incentive of a supermarket coupon of HK\$50 value was given to those who successfully referred

eligible cases to the research team. Our fieldwork supervisors contacted the nominated prospective participants and interviewed them by appointments, using the same procedure and questionnaire as those used for the face-to-face interviews of participants who were clients of the social workers. However, we could only recruit 15 participants of age 15 to 19 with written informed consent through this means, as only two of the 18 participating social work agencies endorsed this mode of data collection. Social workers of the other 16 agencies expressed very strong reservation about potential side-effects of increasing contacts between their clients and the clients' friends that might have behavioral problems. We had two meetings with each of the 16 organizations but were unable to change their position. We respected their concern and stopped recruitment through the snowballing procedure (Appendix 2).

Measures

In consultation with the Narcotics Division, a structured questionnaire was designed for data collection. The same questionnaire was used in the three types of data collection methods. It took about 30 minutes to complete. Information collected included:

1. Socio-demographic variables included age, gender, education level, family income, housing type, whether they are clients of social service agencies, whether they lived with their parent(s), whether their parents were divorced, and duration of living in Hong Kong.
2. Information related to non-engagement included duration of non-engagement, distress due to non-engagement (pressure from family, financial pressure and disappointment), and participation in community activities. The three items on distress were rated on a 4-point Likert scale from "very severe" (1) to "not at all" (4).
3. Previous adversities during childhood were recorded, including being frequently hit by someone or receiving corporal punishment, being arrested and school suspension.
4. Cognitive factors related to psychoactive substance use basing on HBM were evaluated by using a 16-item scale constructed for this study. Each item was rated on a 4-point Likert scale from "strongly disagree" (1) to "strongly agree" (4). Several subscales were used, including Perceived Susceptibility (2 items; $\alpha = 0.85$), Perceived Severity (3 items; $\alpha = 0.88$), Perceived Benefits (4 items; $\alpha = 0.89$), Cue to Action (2 items; $\alpha = 0.91$) and Perceived Self-efficacy (3 items; $\alpha = 0.82$). Two additional items on Perceived Barrier (worry about being arrested and perceived high cost of drugs) were used.
5. Protective factors included attributes of resilience and perceived social support from family and friends. The 9-item Resilience Attributes Scale was constructed for this study ($\alpha = 0.73$), evaluating possession of attributes of resilience including perceived optimism, perceived competence, perceived sense of belongingness to the school, family and society, and competence in coping. Each item was rated on a 11-point Likert scale, from "extremely low" (0) to "extremely high" (10). Perceived availability of emotional and financial social support from friends was evaluated by using two items. Each item was rated on a 4-point Likert scale, from "Definitely yes" (1) to "Definitely not" (4). Family support was evaluated by a 4-item scale. Item responses were Yes/No/Not Sure.

6. Perceptions on drug cessation services for adolescents and youths were measured by two items, evaluating their (i) awareness of the existence of the cessation services, and (ii) perceived effectiveness of the services. Items were responded in the Yes/No format and the Yes/No/Not Sure format respectively. In addition, perceived barriers in using such services were probed, including (a) not knowing where to obtain such services, (b) perceived inappropriateness of such services, (c) not familiar with such services, (d) discomfort felt, (e) fear of being arrested, (f) loss of freedom, (g) fear of letting family members knowing about his/her substance use, and (h) others. Sources of help sought to deal with the problem of substance use (e.g. parents, siblings, social workers, and teachers) were also recorded.
7. Mental health status including loneliness, depression, stress and anxiety were evaluated by three validated scales. The 8-item Loneliness and Social Isolation Scale ($\alpha = 0.82$ in this study) assessed the global feelings of isolation and alienation. Participants were asked to describe their own feelings on a 4-point Likert scale ranging from "I never feel in this way" (1) to "I often feel in this way" (4), with lower scores indicating greater perceived levels of loneliness and isolation. Each item was rated on a 4-point Likert scale from "Often" (1) to "Never" (4). It was validated in Chinese populations and one study showed an α of .84 (Wu & Yao, 2008). The 21-item version of the Depression Anxiety Stress Scales (DASS) is a self-report measure of one-week state of affective syndromes of depression ($\alpha = 0.85$ in this study), tension/stress ($\alpha = 0.83$ in this study) and anxiety ($\alpha = 0.77$ in this study). Participants were asked to rate the extent to which they experienced each of the symptoms depicted in the items during the previous week on a 4-point Likert scale ranging from "Did not apply to me at all" (0) and "Applied to me very much, or most of the time" (3). It has been validated in Chinese populations using confirmatory factor analysis; the three subscales (depression, anxiety and stress) yielded alpha values of .80 to .83 (Taouk, Lovibond, & Laube, 2001).
8. Substance use behaviors were assessed, including ever use of psychoactive substances (ketamine, methylamphetamine, cocaine, cannabis, ecstasy, nimetazepam, flunitrazepam, cough medicines, and others) in the life-time and in the last 12 months. Items were responded on the Yes/No format.
9. Among those who had used substances in the last 12 months, additional questions on the age of onset of psychoactive substance use and frequency on using different types of psychoactive substances in the last month were asked. The pattern of psychoactive substance use in the last six months were evaluated by using 4 items, which identified experiences of (i) multiple drug use behaviors, (ii) mixing psychoactive substances with alcohol, (iii) taking psychoactive substances in mainland China and (iv) having had obtained substances via the internet. Each item was responded on the Yes/No/ Not Sure format. The experiences of relapse after an attempt made to quit using psychoactive substances and the performance of illegal activities in order to purchase psychoactive substances were recorded. Items were responded on the Yes/No format. For those experiencing discomfort due to psychoactive substance use in the last month, their level of discomfort was evaluated by a 5-point Likert scale from "very severe" (1) to "very not severe" (5). The intention to use psychoactive substances in the next 12 months was assessed on a 4-point Likert scale from "definitely not" (1) to "definitely yes" (4).

10. Response to the themes of locally used API and anti-drug slogans were evaluated by two 9-item scales which were constructed for this study, assessing the fear response and perceived efficacy on substance use prevention related to these themes or slogans. Each item was related to one theme/slogan mentioned by the slogans (e.g. drugs cause deaths) and was rated under two dimensions: level of fear induced ($\alpha = 0.93$), and perceived efficacy of preventing you from substance use ($\alpha = 0.85$), using 11-point Likert scales from "totally no effect" (0) to "an extremely large effect" (10).
11. For those who reported that they knew friends who were psychoactive substance users, the level of peer influences on substance use from these peers were measured by a 3-item scale evaluating: (i) having close relationship with substance users; and (ii) having been suggested by friends to use psychoactive substance. Each item was reported on the Yes/No/Not Sure format. Furthermore, a single item measuring the quality of the relationship with their substances using peers was included. The item was rated on a 5-point Likert scale from "extremely good" (1) to "extremely poor" (5). In addition, peer influences on substance use via internet were measured by a single item evaluating: having been suggested by friends via the internet to use psychoactive substance. The item was reported on the Yes/No/Not Sure format.

Statistical analysis

The frequency distributions of the studied variables were tabulated. Univariate analysis was conducted for all the independent variables. The background variables that were found to be significant in the univariate analysis were used as candidates for fitting forward stepwise logistic regression models. The background variables that were significant in the stepwise models was adjusted for when investigating associations between other constructs (e.g. cognitive factor, mental health factors, social influences) and the three dependent variables related to substance use (ever-use of psychoactive substances among all participants, intention to use substances in the next 12 months among never-users, intention to quit using substances among participants who had used psychoactive substances in the last 12 months). Finally, three summary multivariate forward stepwise logistic regression models were fit for each of the three dependent variables on substance use by adjusting for significant background variables and using all other independent variables that were significant in the univariate analysis as candidates for variable selection. SPSS 16.0 for Windows was used for data analysis and a p-value of <0.05 is taken as statistically significant.

Results

Descriptive statistics of the participants' profiles

The section below highlights the socio-demographic characteristics, variables related to non-engagement,

previous adverse life events, mental health status, peer and family support, and peer influence on substance use of the participants. It should be noted that the characteristics of the combined sample depends on the characteristics of the two subsamples and therefore should be used for reference only.

Socio-demographic characteristics

Of all the participants, 52.8% were 19 years old or above (85.5% for the telephone-based sample and 15.6% for the service-based sample); 39.5% were female (42.0% for the telephone-based sample and 36.6% for the service-based sample); 74.3% were living with both parents (76.1% for the telephone-based sample and 72.3% for the service-based sample); 59.1% were living in public housing estates (52.2% for the telephone-based sample and 67% for the service-based sample); 23.4% had divorced parents (18% for the telephone-based sample and 29.5% for the service-based sample) ; 92.5% were living in Hong Kong for more than 10 years or were born in Hong Kong (93.7% for the telephone-based sample and 91.1% for the service-based sample) (Table 1).

Variables related to non-engagement

About 40% (37.2%) of all the participants had been non-engaged for over six months (31.4% for the telephone-based sample and 43.8% for the service-based sample) and 62% were currently not participating in any community activities (70.6% for the telephone-based sample and 52.2% for the service-based sample). About one third of them perceived financial pressure (37%; 40.8% for the telephone-based sample and 32.6% for the service-based sample), family pressure (36.1%; 32.2% for the telephone-based sample and 40.6% for the service-based sample) or felt disappointed (32.2%; 24.7% for the telephone-based sample and 40.6% for the service-based sample) due to their non-engagement experience (Table 1).

Previous adverse life events

Of all participants, 40.9% (27.8% for the telephone-based sample and 55.8% for the service-based sample), 16.5% (9.8% for the telephone-based sample and 24.1% for the service-based sample), 27.3% (10.6% for the telephone-based sample and 46.4% for the service-based sample) and 52.6% (33.7% for the telephone-based sample and 74.1% for the service-based sample) of the participants had been hit or received corporal punishment frequently during their childhood, had been suspended from school, had been arrested or had at least one of the adverse experiences respectively.

Mental health status

Of all participants, the prevalence of probable depression (Depression subscale scores of DASS \geq 10) and anxiety (Anxiety subscale scores of DASS \geq 8) was 28.2% (16.9% for the telephone-based sample

and 41.1% for the service-based sample) and 29.9% (18.4% for the telephone-based sample and 42.9% for the service-based sample), respectively (Table 1).

Peer and family support

Of the participants, 21.3% (31% for the telephone-based sample and 10.3% for the service-based sample) and 37.2% (51.8% for the telephone-based sample and 20.5% for the service-based sample) did not find peer support on emotional and financial problems respectively. Of the four items related to family support, 31.9% (23.6% for the telephone-based sample and 41.5% for the service-based sample) gave two or less item responses reflecting good family support (Table 1).

Peer influences on substance use

About half of the participants had at least one substance using friend (48.4%, 29.4% for the telephone-based sample and 70.1% for the service-based sample); 29.9% (16.5% for the telephone-based sample and 45.1% for the service-based sample) were having close relationships with some psychoactive substance users; 23.4% (14.5% for the telephone-based sample and 33.5% for the service-based sample) and 10% (9.8% for the telephone-based sample and 10.3% for the service-based sample) had been suggested to use psychoactive substances by friends or friends known via the internet respectively (Table 1).

Behaviors and perceptions related to psychoactive substance use

The section below presents the substance use behavior of participants, profile of ever psychoactive substance users and users in the last 12 months, patterns of psychoactive substance use among those who had use psychoactive substances in the last 12 months, cognitions on psychoactive substance use, and perceptions and experiences with cessation of psychoactive substance use. It is again important to highlight that the characteristics of the combined sample is depends on the characteristics of the two subsamples and therefore should be used for reference only.

Substance use behavior

Respectively, 13.7% of the participants recruited through telephone survey and 37.5% of those recruited through NGO or snowballing had ever used psychoactive substances such as ketamine, methylamphetamine, cannabis or ecstasy (Table 1); 16.5% of those recruited through telephone survey and 37.1% of those recruited through NGO or snowballing intended to use psychoactive substances in the following 12 months (Table 2); 44.0% (50% for the telephone-based sample and 58.1% for the service-based sample) of those who had used psychoactive substances in the preceding 12 months had experienced discomfort due to psychoactive substance use in the last month (Table 4).

Among the never-users, 8.6% of those recruited through telephone survey and 17.1% of those recruited through NGO or snowballing believed that they would use psychoactive substances in the next year. Of those who had used psychoactive substances in the last 12 months, 13.6% of those who recruited through telephone survey and 17.7% of those recruited through NGO or snowballing believed that they would quit using psychoactive substances in the next 12 months (Table 2).

Profile of ever psychoactive substance users and users in the last 12 months

Two-third of the participants were male (62.2% for ever users and 59.5% for the users in the 12 months). Due to the study design, more than one third of the psychoactive drug users were 19 years old or above (42.9% for ever users and 39.4% for users in the 12 months) and around 70% had an education level lower than F.3 (66.4% for ever users and 72.6% for the users in the 12 months) (Table 3).

More than half of psychoactive drug users had been non-engaged for over six months (56.3% for ever users and 63.1% for users in the 12 months) and were currently not participating in any community activities (57.1% for ever users and 56% for users in the 12 months). More than one third of them perceived financial pressure (37% for ever users and 39.3% for users in the 12 months), family pressure (49.6% for ever users and 53.6% for users in the 12 months), or felt disappointed (39.5% for ever users and 42.9% for users in the 12 months) due to their non-engagement experience (Table 3).

More than two-third of psychoactive drug users had been hit or received corporal punishment frequently during their childhood (63.9% for ever users and 70.2% for users in the 12 months) or had been arrested (66.4% for ever users and 65.5% for users in the 12 months). About half had been suspended from school (43.7% for ever users and 40.5% for users in the 12 months) (Table 3),

More than half of the psychoactive drug users had probable depression (Depression subscale scores of DASS \geq 10) (47.1% for ever users and 56.0% for users in the 12 months) and anxiety (Anxiety subscale scores of DASS \geq 8) (54.6% for ever users and 65.5% for users in the 12 months).

About 15% (14.3% for ever users and 15.5% for users in the 12 months) and 26% (27.7% for ever users and 26.2% for users in the 12 months) did not find peer support on emotional and financial problems respectively.

Almost all psychoactive drug users had at least one substance using friend (95% for ever users and 100% for users in the 12 months). Most of them had close relationship with psychoactive drug users (69.7% for ever users and 73.8% for users in the 12 months) and had been suggested to use psychoactive substances by friends (68.1% for ever users and 76.2% for users in the 12 months) (Table 3).

Patterns of psychoactive substance use among those who had used psychoactive substances in the last 12 months

Of those participants who had used psychoactive substances in the last 12 months, 56.0% had the age of onset below 15 years old; 36.9% had used psychoactive substances for ≥ 6 times in the last month and 78.6% had used multiple types of psychoactive substances in the last month (Table 4). Some features of psychoactive substance use in the last six months included: simultaneous use of multiple types of psychoactive drugs in a single episode (53.6%), having used psychoactive substances together with alcohol (58.3%), having used psychoactive substances in China (40.5%), having obtained psychoactive substances via the internet (8.3%), and having performed illegal activities due to substance use (13.1%). Only 22.6% of such substance users had sought help from others to deal with their substance use problems (social worker: 16.7%; friends: 16.7%; parents: 3.6%).

Of all those who had used psychoactive substances in the last 12 months, the prevalence of using particular types of substance in the last 12 months (Table 5) was: ketamine (70.2%), methylamphetamine (39.3%), cocaine (57.1%), cannabis (25.0%), nimetazepam (21.4%), cough medicines (15.5%), and ecstasy (11.9%). The frequencies of using such psychoactive substances in the last month were listed in Table 6.

Cognitions on psychoactive substance use

Regarding perceived susceptibility, 32.4% (22.4% for the telephone-based sample and 43.8% for the service-based sample) agreed or strongly agreed that they had been in frequent contact with friends who are psychoactive substance users and 21.1% (14.1% for the telephone-based sample and 29% for the service-based sample) often visited places where people are using such substances. Regarding perceived severity, 77.0% to 89.6% (75.3% to 92.2% for the telephone-based sample and 79% to 86.6% for the service-based sample) of the participants agreed or strongly agreed that the use of psychoactive substances would have harmful effects on their appearance, intelligence, and health. However, 16.1% to 27.1% (12.9% to 22.7% for the telephone-based sample and 19.6% to 30.8% for the service-based sample) of the participants perceived some benefits of using psychoactive substances such as happy feelings, stress reduction, closer friendships, and avoidance of problems in life. Perceived barriers of psychoactive substance use included worry about being arrested (86.6%; 87.5% for the telephone-based sample and 85.7% for the service-based sample) and perceived high cost of psychoactive substances (62.4%; 65.1% for the telephone-based sample and 59.4% for the service-based sample). About 25% (15.3% to 16.1% for the telephone-based sample and 36.2% to 37.5% for the service-based sample) of the participants were exposed to cues to action to use psychoactive substances, including being asked to use psychoactive substances or being given psychoactive substances by their friends. Perceptions of self-efficacy over psychoactive substance use included not perceiving any difficulty in using psychoactive substances (36.5%; 28.2% for the telephone-based sample and 46% for the service-based

sample), not having any difficulty in accessing psychoactive substances (39.5%; 27.8% for the telephone-based sample and 52.7% for the service-based sample), and perception that they could stop using psychoactive substances anytime if they want to do so (34.4%; 24.7% for the telephone-based sample and 45.5% for the service-based sample) (Table 1).

Perceptions and experiences with cessation of psychoactive substance use

Among those who had used psychoactive substances in the last 12 months, only 50% of them knew of some cessation services; 22.6% had used such services; 42.9% believed that such services are efficacious; 61.9% had quitted psychoactive substance use but relapsed (Table 7). Common perceived barriers against quitting being mentioned by the participants included: loss of freedom (45.2%), perceived inappropriateness of such services (35.7%), discomfort (21.4%), fear of being arrested (19.0%), fear of letting his/her family members know about his/her substance use (14.3%).

About half of the participants possessed some positive attitudes associated with cessation: a better chance in finding a job (53.6%) and improvement of relationship with their family members (56.0%). Common negative attitudes about cessation included losing important friends (26.2%) and gaining weight (39.3%). Over 60% of the participants believed that their friends would encourage them to quit psychoactive substance use (63.1%) and that they could exercise control over whether to quit (69.0%) using psychoactive substances (Table 7).

Participants were asked to rate the themes used in the current anti-drug API and slogans of the anti-drug campaigns, in terms of the level of fear induced and perceived efficacy on prevention of substance use. The three messages with the top ratings (i.e. having the largest number of participants rating ≥ 7 out of 10) were: disappointing the family, destroying the future and causing brain damages. It is interesting that these ratings were higher than that of the warning against death caused by substance use (Table 8).

Factors associated with ever use of psychoactive substances (among all participants)

Background factors

The results were summarized in Table 9. In the univariate analysis, those participants who were recruited from the NGOs and peer referrals and those living in public housing estates were more likely than others to be ever users of psychoactive substances (OR=2.04 to 3.77, $p < .05$). Protective factors against ever use of psychoactive substances included higher age (19-24), higher education levels (Form 4-5 and Form 6 or above) and higher family monthly income levels (\$8,000-\$24,999 and \geq \$25,000) (OR=.03 to .59, $p < .05$). Gender was not a significant factor (Female: OR=0.91, 95% CI=.6 to 1.4; $p > .05$). In the multivariate analysis, only higher education levels (Form 4-5: OR=.29, 95% CI=.18, .46; Form 6 or above: OR=.03, 95% CI=.01, .1; reference group was Form 3 or below) remained statistically significant.

The results suggested that education level was strongly associated with age, family monthly income, housing type and mode of recruitment (being clients of social workers) and these variables became non-significant after controlling for education level.

Factors related to non-engagement and previous adversities

In the univariate analysis, longer duration of non-engagement ("7- 12 months" and "more than 12 months") and distress due to non-engagement (perceived family pressure and disappointment) were significantly associated with ever use of psychoactive substances (OR=1.54 to 3.72, $p < .05$). Previous adversities such as being frequently hit by someone or receiving corporal punishment during childhood, school suspension and having been arrested by police were risk factors associated with ever use of psychoactive substances (OR=3.54 to 11.70, $p < .05$; Table 10). All these variables remained significant (OR= 1.74 to 6.78, $p < .05$) after adjusting for education level, except for disappointment due to non-engagement (OR=1.21, 95% CI=.75, 1.94).

Factors related to peer and family support

In the univariate analysis, perceived family support (caring family members, perception that the family shows understanding, willing to help him/her and perceived good relationship with family members) was protective factor of ever use of psychoactive substances (OR=.21 to .56, $p < .05$). However, variables on perceived availability of peer support (both emotional and financial support) were risk factors of ever use of psychoactive substance (OR=1.76 to 1.86, $p < .05$; Table 10). After adjusting for education level, most of the variables on perceived family support (caring family members, perception that the family is willing to help him/her and perceived good relationship with family members; OR=.33 to .54, $p < .05$) remained significant protective factors of ever use of psychoactive substances, except for perception that family shows understanding to the participant (OR=.85, 95% CI=.53, 1.35). However, the two variables related to peer emotional support (OR=1.51, 95% CI=.82, 2.79) and peer financial support (OR=1.17, 95% CI=.71, 1.93) became non-significant after adjusting for education level.

Factors related to influences of peers on psychoactive substance use

The results of the univariate analysis showed that peer influences were strong risk factors associated with ever use of psychoactive substances: having had friends who are substance users (OR=40.73, 95% CI=19.73, 84.05), having been suggested by friends to use psychoactive substances (OR=7.19, 95% CI=4.03, 12.82) and having been suggested by friends via the internet to use psychoactive substances (OR=3.21, 95% CI=1.74, 5.91)). All these factors (OR= 3.68 to 34.89, $p < .05$) remained significant after controlling for education level.

Psychological factors

In the univariate analysis, anxiety, depression, stress and loneliness and social isolation, as measured by higher DASS scores (OR=1.16 to 1.27, $p<.05$), and lower Loneliness and Social Isolation Scale scores (OR=.94, 95% CI=.90, .99), were all significant risk factors of ever use of psychoactive substances. Reversely, resilience was a significant protective factor (Resilience Attribution Scale; OR=.96, 95% CI=.94, .98). After adjusting for education level, all the aforementioned risk factors (OR=1.12 to 1.19, $p<.05$) remained statistically significant, except for the association with the Loneliness and Social Isolation Scale (OR=.96, 95% CI=.92, 1.00). The protective factor of resilience (OR=.98, 95% CI=.96, 1.00) also became statistically non-significant after adjusting for education level.

Cognitions and emotions related to psychoactive substance use

In the univariate analysis, four of the scales derived from HBM (Perceived Susceptibility Scale, Perceived Benefit Scale, Cue to Action Scale and Perceived Self Efficacy Scale) were significant risk factors associated with ever use of psychoactive substances (OR=1.56 to 2.33, $p<.05$); whilst the two variables related to perceived barriers, worry about arrest (OR=.67, 95% CI=.53, .84) and high cost of substance use (OR=.48, 95% CI=.38, .60) were both protective factor of ever use of psychoactive substances. The level of fear (OR=.98, 95% CI=.97, .99) and perceived efficacy on prevention (OR=.98, 95% CI=.97, .98) associated with the themes of anti-drug API and slogans were both protective factors. After adjusting for education level, all these risk (OR=1.51 to 2.16, $p<.01$) and protective (OR=.48 to .98, $p<.01$) factors remained statistically significant.

Multivariate analysis of factors associated with ever use of psychoactive substances

The multivariate analysis was obtained by adjusting for education level (ENTER) and fitting a forward stepwise logistic regression model to select significant variables from the pool of all variables that were significant in the aforementioned univariate analyses.

The results are shown in Table 10. A total of five variables were found to be significant risk factors: 1) history of having been arrested by the police (ORM=4.12; 95% CI=1.84, 9.25), 2) perceived availability of emotional support from peers (ORM=5.27, 95% CI=1.6, 17.34), 3) having had many or all of his/her friends being substance users (ORM=15.72, 95% CI=5.39, 45.88), 4) higher Perceived Benefits Scale scores (ORM=1.3, 95% CI=1.13, 15) and 5) higher Perceived Self-efficacy Scale scores (OR=1.49, 95% CI=1.22, 1.81). In addition, one protective factor was found: perceived barrier about the high cost of psychoactive substances (ORM=.61, 95% CI=.4, .94).

Factors associated with the intention to use psychoactive substances in the next 12 months (among never-users of psychoactive substances)

Background factors

The results were summarized in Table 11. In the univariate analysis, never-users who were recruited from NGO, living with neither of the parents and having divorced parents were more likely than others to be intended to use psychoactive substances in the next 12 months. Protective factors included higher age (19-24) and higher education levels (Form 4-5 and Form 6 or above). Gender was not significant (Female: OR=1.09, 95% CI=.57, 2.08; $p>.05$) The multivariate analysis showed that only the variable on divorced parents (ORM=2.12, 95% CI=1.06, 4.25) was of statistical significance. The results suggested that having divorced parents was strongly associated with age, education level, living with neither of the parents and mode of recruitment (being clients of social workers).

Factors related to non-engagement and previous adversities

In the univariate analysis, longer duration of non-engagement (7-12 months; OR=2.56, 95% CI=1.11, 5.88) and distress due to non-engagement (perceived financial pressure, family pressure and disappointment; OR=1.94 to 4.46, $p<.05$) were significantly associated with the intention to use substances in the next 12 months among never-users. Previous adversities such as being frequently hit by someone or receiving corporal punishment during childhood, and school suspension were also risk factors (OR=2.10 to 6.47, $p<.05$; Table 12). After adjusting for having divorced parents, longer duration of non-engagement (7-12 months), distress due to non-engagement (perceived financial pressure and disappointment) (OR=1.99 to 4.26, $p<.05$), previous adversities such as being frequently hit by someone or receiving corporal punishment during childhood, and school suspension (OR=1.94 to 6.27, $p<.05$) remained significant risk factors associated with the intention to use psychoactive substances in the next 12 months among never-users.

Factors related to peer and family support

In the univariate analysis, perceived family support (caring family members and good relationship with family members; OR=.42 to .47, $p<.05$) was a protective factor of the intention to use psychoactive substances in the next 12 months among never-users. However, perceived availability of peer support (financial support; OR=3.33, 95% CI=1.50, 7.41) was a risk factor (Table 12). Adjusting for having divorced parents, perceived family support (good relationship with family members; OR=.48, 95% CI=.24, .96) remained a significant protective factor and perceived peer financial support (OR= 3.09, 95% CI=1.38, 6.92) remained a significant risk factor associated with intention to use psychoactive substances in the next 12 months among never-users.

Factors related to influences of peers on substance use

The univariate analysis showed that having been suggested by friends to use substances (OR=4.35, 95%

CI=1.75, 10.81) was a risk factor associated with intention to use psychoactive substances in the next 12 months among never-users. It remained significant after adjusting for having divorced parents (OR=4.25, 95% CI=1.69, 10.67).

Psychological factors

In the univariate analysis, anxiety, depression, stress and loneliness and social isolation (as measured by higher DASS scores (OR=1.14 to 1.20, $p<.05$) and lower Loneliness and Social Isolation Scale scores (OR=.92, 95% CI=.86, .99)) were all risk factors associated with intention to use psychoactive substances in the next 12 months among never-users. Reversely, resilience (Resilience Attributes Scale; OR=.96, 95% CI=.93, .99) was a protective factor. Adjusting for having divorced parents, all risk factors (anxiety, depression and stress: OR= 1.13 to 1.19, $p<.01$; loneliness and social isolation: OR=.93, 95% CI= .86, .99) and protective factor (Resilience Attributes Scale, OR=.96, 95% CI=.93, .99) remained statistically significant.

Cognitions and emotions related to substance use

The four scales relating to HBM (Perceived Susceptibility Scale, Perceived Benefit Scale, Cue to Action Scale and Perceived Self Efficacy Scale; OR=1.31 to 1.79, $p<.01$) were significant risk factors, while the two variables relating to perceived barriers (worry about arrest (OR=.56, 95% CI=.40, .79) and high cost (OR=.58, 95% CI=.42, .80)) were protective factors of intention to use substances in the next 12 months among never-users. The level of fear and perceived efficacy on prevention associated with the themes of anti-drug API were also protective factors (Table 12). After adjusting for having divorced parents, all of the aforementioned HBM-related risk factors (OR=1.30 to 1.74, $p<.01$) and protective factors (OR=.56 to .58, $p<.01$) remained significant. However, the two variables on the level of fear (OR=.99, 95% CI=.97, 1.00) and perceived efficacy (OR=.99, 95% CI=.97, 1.00) of the anti-drug API became non-significant after adjusting for having divorced parents.

Multivariate analysis of factors associated with intention to use psychoactive substances in the next 12 months (Among never-users of psychoactive substances)

The multivariate analysis was obtained by adjusting for having divorced parents (ENTER) and fitting a forward stepwise logistic regression model to select variables from the pool of all variables that were significant in the aforementioned univariate analyses. The results are shown in Table 12. Two variables were found to be significant risk factors associated with intention to use psychoactive substances in the next 12 months among never-users: 1) disappointment due to non-engagement (ORM=6.81, 95% CI=2.45, 18.92), and 2) having been suggested by friends to use substances (ORM=5.44, 95% CI=1.91, 15.53). No protective factors were found to be significant in this multivariate analysis.

Factors associated with intention not to use psychoactive substances in the next 12 months (among those who had used substances in the last 12 months)

The background variables considered were listed in Table 13. Discomfort due to substance use experienced in the last month was the only variable that was significantly associated with the intention not to use substances in the next 12 months among current substance users (OR=2.97, 95% CI=1.11, 7.93). It should be cautioned that this analysis was based on a small sample size of 84 participants who had used substances in the last 12 months.

Discussion

Our data showed that the prevalence of psychoactive substance use was much higher among those that were recruited from the NGO (clients of social workers) as compared to those participating in the random telephone survey (ever use: 37.5% versus 13.7%; last 12 months: 27.7% versus 8.6%). The prevalence of both of these two samples was hence alarmingly high and was higher than the prevalence of ever-use of 4.3% among secondary students (Narcotic Division, 2010b) and 9.3% among younger adults of the male general population (Lau, Kim, & Tsui, 2005). Overall, the higher rates of substance use among NEY is consistent with the higher rates of substance use among early school leavers and unemployed teenagers reported in the previous studies (Bond et al., 2007; Fergusson, Horwood & Lynskey, 1997; Henry et al., 2012; Townsend, Flisher & King., 2007; Suvisaari et al., 2009). It is also important to point out that the prevalence of intention to use psychoactive substances in the next 12 months among never-users (8.6% for the phone-based sample and 17.1% for the service-based sample) and ever-users (65.7% for the phone-based sample and 70.2% for the service-based sample) was also high

It is uncertain whether the NEY of the community sample were 'hidden youths' but 62% of them were not involved in any community activities. Increased and innovative efforts to assess these NEY and to provide them with anti-drug prevention or harm reduction services are greatly warranted. Interestingly, unlike the student population, gender was not of statistical significance. Therefore, health promoters cannot assume it to be only a male problem. Gender specific strategies may need to be developed

Hence, NEY is probably one of the social groups with the highest prevalence of substance use in Hong Kong. Though the prevalence of NEY fluctuates according to the economic situation, unemployment rate is always high among adolescents and youths. The prevalence of NEY was 2.2% (2009) in the 15-24 year-old population (total population of age 15-24: 870,000; Census & Statistic Department, 2011). New young cohorts are going to add numerous new substance users accumulatively to the pool of existing substance users. The number would keep increasing unless effective prevention and cessation programs are in place. As the prevalence of substance use among NEY is high, we suggest more resources to be invested in prevention work targeting this group

The high prevalence of substance use among NEY may be related to their developmental needs and problems. It is noted that high proportions (18% for the phone-based sample and 29.5% for the service-based sample) of the participants had had divorced parents or were not living with both parents. Many of these NEY had had a tough time in the developmental phase of their life. Previous adversities such as probable physical maltreatment (27.8% for the phone-based sample and 55.8% for the service-based sample), school suspension and police arrest were also highly prevalent. These variables were statistically significant in the univariate analysis for ever-use and intention to use substances in the next year. Substance use is therefore one of the behavioral problems that are prevalent among children growing up in broken families. Besides general support to be provided to children of single parent, it is suggested that some specific anti-drug campaigns should target these children by removing risk factors and building up protective factors. A cohort study on substance use behaviors and risk factors for children in broken families would facilitate design of intervention at the younger age. Furthermore, previous international and local data have pointed out that physical maltreatment during childhood was associated with substance use among adolescents as well as other behavioral and psychological problems (Lau, Kim, Tsui, Cheung, et al., 2005). Parents should be reminded of the potential long-term harm of physical maltreatment, including potential harms of corporal punishment, which is still common in Hong Kong (Lau, Liu, Cheung, Yu, & Wong, 1999; Tang 2006).

About 40% of all the participants had had their duration of non-engagement longer than seven months (31.4% for the phone-based sample and 43.8% for the service-based sample). It is seen that duration of non-engagement of 7 to 12 months was significantly associated with a higher likelihood of substance use as compared to a shorter duration of non-engagement. Therefore, we cannot underestimate the effect of non-engagement lasting for a year or less. It is important to find out that participation in community activities (e.g. volunteer work in community centre or church) was not a protective factor against substance use. Involving NEY in some community activities might not be able to substitute the non-engagement in work and study, which play an important role in one's self-esteem and personality formation (Jimenez, Musitu, Ramos, & Murgui, 2009). Since this was a cross-sectional study, we were unable to discern whether substance use was the cause or the consequence of non-engagement, but the size of the problem has been revealed by our data.

Furthermore, very high percentages of the participants showed signs of distress (financial pressure, family pressure and disappointment) due to the non-engagement. Loneliness and social isolation was associated with duration and distress related to non-engagement (Pearson correlation coefficients=0.16 to 0.30, $p<0.001$). Importantly, these indicators were associated with ever-use among all participants and/or intention to use substances in the next 12 months among never-users. Interventions should increase the ability of NEY to cope with distress due to the non-engagement. Positive psychology plays a role in prevention of substance use (Gillham, Reivich, & Shatte, 2002). Resilience is the ability to rebound from adversities (Wolff, 1995). Previous research has reported its protective effects on

behaviors, such as substance use among youths (Hodder et al., 2011) and it is also a significant protective factor in this study. Furthermore, it can also be achieved through interventions (Hodder et al., 2011) and hence should be brought to the attention of health promoters.

Psychological counseling, including those involving their family members is warranted as the prevalence of depression and anxiety was high (16.9 and 18.4% for the phone-based sample; 41.1 and 42.9% for the service-based sample). Both of these variables were significantly associated with ever-use and/or intention to use substances. Social workers serving NEY should be made aware of these needs and be well supported by mental health professionals. Research on availability of such services and related service seeking behaviors among NEY is warranted.

The majority of the NEY participants were not deprived of caring, helpful family members and good family relationship, although about half of them did not feel well understood by the family members. Corroborating with the results of other studies (Wills et al., 2004), our univariate analysis showed that these family support factors were strongly associated with ever-use and/or intention to use psychoactive substances. Understanding is seen to be lacking by many participants, and family pressure was a risk factor of substance use. Health promoters should therefore, instill better family support among NEY, especially building up good family relationships and enhancing understanding of the stress faced by NEY. There are rooms for improvement.

Peer support was however, a totally different story. Although the majority of the participants perceived available peer support, such support was associated with increased risks for ever-use and/or intention to use among never-users. The literature has explained that not all types of social support would lead to desirable health outcomes (Suh, Mandell, Latkin, & Kim, 1997). Social support among drug users was especially found to have adverse effects, such as HIV infection and sex risk (Miller & Neaigus, 2002). The associations between peer support and risk of psychoactive substance use are understandable as about half of the participants had had some friends who were substance users and high percentages of them had had close relationships with substance users (29.4% and 16.5% for the phone-based sample and 70.1% and 45.1% for the service-based sample). Peer influences were among the strongest risk factors found in this study, including suggestions to use substances made by peers. Subjective norm, a construct of TPB, is defined as significant others' approval of the health-related behaviors and it has been shown to be significantly associated with the health-related behavior (Sheeran, Conner, & Norman, 2001), including substance use (Umeh & Patel, 2004). Anti-drug campaigns targeting NEY needs to take this into account. It is necessary to replace substance using peers by other types of significant others, such as family members or peers living healthy life-styles. In social marketing sense, we have to deal with competitions leading to substance use (Ministry of Health, 2008). Participants also need to be equipped with training on independent thinking and skills to refuse invitations to use substance. This is especially important for the high percentages of the never-users (8.6% for the phone-based sample and 17.1% for the service-based sample) indicating that they intended to use psychoactive substances in the

next 12 months. Testimonials of those ex-users to convince their significant others may also be useful. Cautions should also be given to activities casually grouping adolescent substance users together as such occasions may increase the likelihood of expanding their substance using peer networks.

HBM is one of the commonly used behavioral health models in explaining health-related behaviors which has also been applied to understand substance use behaviors. It is interesting to point out that perceived severity of drug use was not significantly associated with ever use and intention to use psychoactive substances. This is an important remark as most of the anti-drug strategies in Hong Kong seem to be emphasizing on the severity of substance use, such as physical damages. The results however, suggest that such approaches may not be the most effective strategies. Youths may have health values which are largely different from those of adults (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Ouadrel, 1993). They may see the health consequences as remote and irrelevant (Beyth-Marom et al., 1993). Furthermore, people tend to underestimate the risk of having bad consequences of a risk behavior happening to oneself as compared to others (Arnett, 2000). More understanding of the clients is warranted, according to social marketing principles (Ministry of Health, 2008). A review on the prevention strategies basing on increasing perceived severity of the consequences of substance use may be useful and operational research to investigate potential impacts of various strategies are warranted.

Perceived benefit, unlike perceived severity, was a significant factor. The gratifications of substance use (e.g. stress relief, escape from problems, closer relationship with friends, happy feelings) are immediate and relevant to the youths. According to social marketing, health promotion needs to consider exchanging these benefits with cost. Two barriers (fear about arrest and perceived high cost of the substances) were significant protective factors. The legal consequence seems more relevant to youths than the physical harms. Previous local research has found that pocket money was the major financial source for purchasing substances in school children (Narcotic Division, 2010b). Another study conducted in a western country showed that availability of large amount of pocket money among students was a risk factor of substance use (Buelga, Ravenna, Musitu, & Lila, 2006). Parents should be more aware of how their children are spending their pocket money which should not be excessive. As expected, cue to action of HBM (being asked by peers to use substances and being given drugs by peers) was also significant risk factors. Such risk factors echo the significance of other factors related to peer influences. Health promoters may consider the significance of these cognitive risk factors to adjust the contents of their anti-drug messages.

Information about the patterns of psychoactive substance use would also provide health care workers with some insights for prevention of substance use. Close to 50% of the substance ever-users had been using substances for at least three times a month. Therefore, most of them are regular substance users. Among users, we found that over half of them had their onset at age 14 or earlier. The result is consistent with those of some other local studies (Hong Kong Legislative Council Secretariat, 2009). Primary prevention programs should therefore start early and possibly in primary schools – especially to those

with single parents. Early detection of high risk students and provision of secondary prevention to these students are also warranted. Some harm reduction health promotion may be needed. It is dangerous to use multiple drugs and combining drugs and alcohol (Harris, Everhart, Mendelson, & Jones, 2003). However, our data showed that such practices were quite common. It is uncertain how much the substance users worried about the potential harms of such dangerous practices.

Furthermore, about 40% of the substance users had used substances in mainland China in the last six months. Therefore, cross-border anti-drug efforts are still required. Previous studies reported that unemployment, cheaper price for drug, perceived less chance of being arrested and peer influences were the main reasons for cross-border substance use practice (Lau, Kim, & Tsui, 2005, Lau, Tsui, & Lam, 2007, Hong Kong Council of Social Service, 2001). Our results were consistent with that of these previous studies. Social workers should be aware of the environmental risk when they were working with their NEY clients.

There seems to be a demand for cessation services as about 60% of the sampled substance users (last 12 months) had attempted to quit but failed. About 17% and 32% of the substance users (last 12 months) perceived that there was no chance or only some chances of using substances in the next 12 months respectively, indicating their wish to quit. Health promoters should however keep in mind that very few of the substance users have sought help from others to deal with their substance use problem. They might feel that help is not needed as they do not have a problem but it was shown that half of the substance users were unaware of cessation services. Furthermore, loss of freedom of the cessation services was the most frequently mentioned barrier against using cessation services among those who were aware of the existence of cessation services. Research is warranted to understand more about help and service seeking behaviors among substance users.

It is interesting to see that worry about gaining weight was mentioned by about 40% of the substance users to be a disincentive of cessation. There are studies reporting that some youths have been using substances as a means of weight control (Cance, Ashley, & Penne, 2005). There is a dearth of local data on this topic and future studies are warranted. In contrast, improved chances of finding a job and improvement of family relationship were incentives of cessation. Such supportive services are warranted.

With the small sample size of substance users (last 12 months), we only found one variable, discomfort due to substance use, to be strongly associated with the intention of not to use psychoactive substances in the next 12 months among those who had used psychoactive substances in the last 12 months. Different strategies are required for the prevention of substance use and cessation of substance use. Substance users would experience discomforts that would not be known to never-users, who may hence consider perceived severity as non-significant. Discomforts are different from long-term damages as these are immediate and may be seen as more relevant by youths. A few variables yielded p values of

<.2 in the analysis of factors associated with intention of not using substances among substance users, including whether they know about the cessation services and use multiple types of substances simultaneously. Such variables might become statistically significant given a larger sample size.

The results of the multivariate analysis found that education level, worry about police arrest, peer support, peer influences and cognitive factors (e.g. perceived benefit, perceived barrier and perceived self-efficacy to substance use) were associated with ever use of psychoactive substances, and divorced parents, distress due to non-engagement (e.g. disappointment due to non-engagement) and peer influence (e.g. having been suggested by their friends to use psychoactive substances) were associated with the intention to use substances in the next year among never-users. Such results, again, reminded us about the very high importance of peer influences and cognitive beliefs of the NEY in determining substance use behaviors and intentions.

It seems that some of the themes currently used in anti-drug campaigns are related to the fear appeal approach (Dejong & Wallack, 1999). It is encouraging to see the overall scales of the levels of fear and perceived effectiveness of the themes/slogans used in anti-drug campaigns were found to be significantly associated with ever use and intention to use psychoactive substances. There are some interesting insights which may lead to improvements. Our results interestingly showed that the level of fear associated with messages about some physical damages (deaths and frequent urination) was seen as less fearful and/or as less effective in preventing the participants to use psychoactive substances, as compared to themes referring to social damages (e.g. hurting the family and destroy the future). This is consistent with the results that perceived severity of physical harm was non-significant. These observations are supported by research findings that adolescents and youths are more concerned about immediate feelings [rewards] over long-term benefits (Pechmann, Levine, Loughlin, & Leslie, 2005). Some slogans (e.g. Be smart Be free and Drugs? No way?) were apparently rated as not being too effective. Evidence-based, formative research may facilitate design of more effective anti-drug messages. Thus, the results of this study provide some crude evaluations of the messages used in the local anti-drug campaign in an especially high risk population of NEY. More formal evaluations are also warranted.

Limitations of the study

The sample contained two groups of participants recruited from different sources, which had different characteristics and proportion of drug users. We compared those characteristics in the report. However, we believe that the associations between the independent variables (socio-demographic, cognitive and psychological) under investigation and the dependent variables related to drug use should follow similar directions in both groups. We tested this assumption of directionality by looking at separate analysis of the risk factors of ever use of drugs for the two groups and found similar directions in almost all of the associations (Appendix 5) . We however, could not test the assumption of similar directionality for the two other dependent variables (intention to use drugs among non-users and intention not to use drugs

among users) as there were too few cases showing intention in each of the two groups to allow for such logistic regression analysis. The approach of analysing associated factors using combined samples recruited from different sources has been common and acceptable in many published studies on hard-to-reach populations, including those on drug use (Des Jarlais et al., 2000; Folch, Esteve, Zaragoza, Muñoz, & Casabona, 2010; Lau, Cai, Tsui, Chen, & Cheng, 2009; Lau et al., 2012; Lau, Kim, & Tsui, 2008; Lau et al., 2013; Mak, Ng, Mo, & Chong, 2010; Stokes, Venable, & McKirnan, 1997). It is acknowledged that NEY is an extremely hard-to-reach population. The sampling of this study was therefore inevitably subjected to potential sampling biases but in the absence of any sampling frame, it was a good attempt to collect data from this vulnerable group and we believe that the results have brought insights to programmers and health workers.

The study has other limitations. First, the definition of NEY is operational as no official definition is available. The Commission on Poverty defines NEY as persons aged 15-24 who are economically inactive for reasons other than “students”, “home-makers” and “health problems”, excluding unemployed youths of this age group. Nevertheless, other researchers adopted a different definition (Cheng-Lai & Dorcas, 2011; Commission on Youth, 2003; Shek & Lee, 2004). Second, there was no good sampling frame. The main data set was recruited by using a random telephone number survey. However, some NEY could not be accessed via fix-line phones. We sampled from three sources, attempting to give both overall estimates for all NEY and those for an important subgroup of clients of social workers. The multiple sample methods also allow us to cover those served and not served by social workers. It is acknowledged that the characteristics of participants recruited from different sources may vary and may not be comparable. This is coupled by the fact that the age range of the two samples was different. We therefore presented the prevalence of the two samples separately and readers are reminded that the overall prevalence of all participants were for references only. Furthermore, our snowballing only recruited a small number of participants and our sampling could not be extended through social networks of NEY. Third, we presented a list of psychoactive substances (e.g. ketamine, methylamphetamine, cannabis or ecstasy) to the participants when we asked about their substance use and intention to use substances. The definition of psychoactive substances might vary among the participants. Fourth, the number of substance users identified by this study was relatively small: the number of participants recruited from telephone surveys was revised from 800 to 250 (approved by the Research Advisory Group) due to the lower than expected prevalence of NEY in 2011-12, which was less than 2.2% (Hong Kong Labour and Welfare Bureau, 2010). Fifth, the results may be subjected to reporting bias, as substance use is both socially undesirable and illegal. This means that the reported prevalence has likely been under-reported. Despite these limitations, the study has reported rich information about behaviors and intention related to substance use in a high risk and hard-to-reach population. The size of the problem demands attention and effective interventions, which needs to be comprehensive, theory-based and evidence-based.

Summary and conclusion

We summarize some specific recommendations that were made basing on our findings.

1. Additional resources should be allocated to anti-drug campaigns targeting NEY as the size of the problem seems alarming. Such campaigns should target both males and females.
2. Strengthened support should be provided to outreach social workers as many of their clients are substance users or potential substance users. Such support may include training about substance use prevention, referrals to mental health professionals, and additional resources to implement anti-drug services targeting NEY.
3. Anti-drug prevention programs should be provided at schools targeting high risk individuals such as potential drop-outs and those with single parents. Such programs should start early. Resources should be given to follow up those who drop-out from schools.
4. Anti-drug prevention programs targeting NEY needs to be more comprehensive. It should tackle perceived benefits, perceived self-efficacy and cues to action according to our findings. Barriers should be increased, including prosecutions and cautions about use of pocket money. It should increase benefits of job-finding and family relationship. Such programs should involve family members and psychologists and to remove distress due to non-engagement and mental health problems. It needs to compete with the negative peer influences by creating new meaningful relationships and skills to resist invitations to use substances. Substance use among NEY needs to be seen as one of the negative outcomes of previous adversities interacting with loneliness and frustration of non-engagement, in the context of negative peer influences. Dissemination about long-term severe consequences may not be adequate to solve the problem.
5. Anti-drug messages targeting NEY may be reviewed as this group have their special characteristics, with the possibility of shifting from long-term physical consequences to immediate responses such as discomfort, prosecution, harm to family relationship, and difficulty in finding a job. It is recommended that some formative operational research should be conducted to design effective campaign.
6. Social workers should also be made aware of existing cessation services. A campaign to promote such services may be necessary as there seems to be a demand but the awareness and utilization of such services among NEY seems to be low. Such campaigns should take different strategies from the existing one which highlights harms of substance use. It also needs to take into account worry about prosecution, family responses and other logistic factors. Research is warranted to understand further factors affecting health services utilization behaviors.

All in all, we need to understand our clients better so as to design effective programs preventing and controlling psychoactive substance use among NEY. The problem is multi-dimensional and involves different stakeholders such as family members, peers, and interdisciplinary health professionals.

Table 1 Descriptive statistics (Among all participants, n=479)

	Respondents					
	Respondents recruited by phone survey		Respondents recruited from NGO or snowballing		All	
	n	%	n	%	n	%
<u>Socio-demographic variables</u>						
Age group (years)						
15	0	0.0	46	20.5	46	9.6
16	0	0.0	45	20.1	45	9.4
17	0	0.0	57	25.4	57	11.9
18	37	14.5	41	18.3	78	16.3
19	31	12.2	35	15.6	66	13.8
20	45	17.6	0	0.0	45	9.4
21	34	13.3	0	0.0	34	7.1
22	39	15.3	0	0.0	39	8.1
23	31	12.2	0	0.0	31	6.5
24	38	14.9	0	0.0	38	7.9
Gender						
Male	148	58.0	142	63.4	290	60.5
Female	107	42.0	82	36.6	189	39.5
Education level						
F.3 or below	30	11.8	141	62.9	171	35.7
F.4-5	109	42.7	78	34.8	187	39.0
F.6 or above	116	45.5	5	2.2	121	25.3
Living with parents						
Both	194	76.1	162	72.3	356	74.3
Father only	7	2.7	12	5.4	19	4.0
Mother only	30	11.8	35	15.6	65	13.6
None	24	9.4	15	6.7	39	8.1
Having divorced parents						
Yes	46	18.0	66	29.5	112	23.4
No	209	82.0	158	70.5	367	76.6
Duration of stay in Hong Kong						
Below 1 year	1	0.4	1	0.4	2	0.4
1-4 years	2	0.8	2	0.9	4	0.8
5-10 years	13	5.1	17	7.6	30	6.3
Above 10 years or were born in HK	239	93.7	204	91.1	443	92.5
Family monthly income (US\$1=HK\$7.8)						
<8000	14	5.5	21	9.4	35	7.3
8000-24999	117	45.9	71	31.7	188	39.2
≥25000	35	13.7	34	15.2	69	14.4
Don't know	89	34.9	98	43.8	187	39.0
Housing type						
Private	34	13.3	23	10.3	102	21.3

Public	133	52.2	150	67.0	283	59.1
Home Ownership Scheme	65	25.5	37	16.5	57	11.9
Staff quarter	3	1.2	0	0.0	3	0.6
Others	20	7.8	14	6.2	34	7.1
<u>Variables related to engagement</u>						
Duration of non-engagement						
3-4 months (0-25 percentile)	88	34.5	87	38.8	175	36.5
5-6 months (26-50 percentile)	87	34.1	39	17.4	126	26.3
7-12 months (51-75 percentile)	42	16.5	56	25.0	98	20.5
More than 12 months (76-100 percentile)	38	14.9	42	18.8	80	16.7
Participation in any community activity currently						
No	180	70.6	117	52.2	297	62.0
Yes	75	29.4	107	47.8	182	38.0
<u>Distress due to non-engagement</u>						
Perceived financial pressure						
Very large / large	104	40.8	73	32.6	177	37.0
Small / none	151	59.2	151	67.4	302	63.0
Perceived family pressure						
Very large / large	82	32.2	91	40.6	173	36.1
Small / none	173	67.8	133	59.4	306	63.9
Disappointment due to non-engagement						
Very large / large	63	24.7	91	40.6	154	32.2
Small / none	192	75.3	133	59.4	325	67.8
No. of items related to distress due to						
0	104	40.8	85	37.9	189	39.5
1	76	29.8	55	24.6	131	27.3
2	52	20.4	52	23.2	104	21.7
3	23	9.0	32	14.3	55	11.5
<u>Adverse experiences</u>						
Being frequently hit or received corporal punishment during childhood						
No / Don't know	184	72.2	99	44.2	283	59.1
Yes	71	27.8	125	55.8	196	40.9
Had ever been suspended by school						
No / Don't know	230	90.2	170	75.9	400	83.5
Yes	25	9.8	54	24.1	79	16.5
Had ever been arrested						
No / Don't know	228	89.4	120	53.6	348	72.7
Yes	27	10.6	104	46.4	131	27.3
At least one of the adverse experiences						
No / Don't know	169	66.3	58	25.9	227	47.4
Yes	86	33.7	166	74.1	252	52.6
<u>Psychological variables</u>						
Depression ¹						
No	212	83.1	132	58.9	344	71.8
Yes	43	16.9	92	41.1	135	28.2

Anxiety ²						
No	208	81.6	128	57.1	336	70.1
Yes	47	18.4	96	42.9	143	29.9
<u>Perceived availability of peer support</u>						
Available peer support on emotional problems						
Definitely no / Unlikely	79	31.0	23	10.3	102	21.3
Definitely yes / Likely	176	69.0	201	89.7	377	78.7
Available peer support on financial problems						
Definitely no / Unlikely	132	51.8	46	20.5	178	37.2
Definitely yes / Likely	123	48.2	178	79.5	301	62.8
Number of items indicating availability of peer						
0	70	27.5	10	4.5	80	16.7
1	71	27.8	49	21.9	120	25.1
2	114	44.7	165	73.7	279	58.2
<u>Family support</u>						
Being cared by family member						
No / Not sure	34	13.3	60	26.8	94	19.6
Yes	221	86.7	164	73.2	385	80.4
Family members show understandings						
No / Not sure	108	42.4	138	61.6	246	51.4
Yes	147	57.6	86	38.4	233	48.6
Family members are willing to help						
No / Not sure	26	10.2	48	21.4	74	15.4
Yes	229	89.8	176	78.6	405	84.6
Good relationship with family member						
No / Not sure	58	22.7	82	36.6	140	29.2
Yes	197	77.3	142	63.4	339	70.8
Number of items indicating family support						
0	18	7.1	29	12.9	47	9.8
1-2	42	16.5	64	28.6	106	22.1
3-4	195	76.5	131	58.5	326	68.1
<u>Peer influences over substance use</u>						
Having friends who are substance users						
None	180	70.6	67	29.9	247	51.6
Some of them	52	20.4	106	47.3	158	33.0
Many of them	21	8.2	47	21.0	68	14.2
All	2	0.8	4	1.8	6	1.3
Having close relationship with substance users						
No and no such friends	213	83.5	123	54.9	336	70.1
Yes	42	16.5	101	45.1	143	29.9
Having been suggested by friends to use substances						
No / don't know / No such friends	218	85.5	149	66.5	367	76.6
Yes	37	14.5	75	33.5	112	23.4
Having been suggested by friends via the internet to use substance						
No / not sure	230	90.2	201	89.7	431	90.0
Yes	25	9.8	23	10.3	48	10.0

Substance use behaviors and intentions

Had ever used psychoactive substance

No	220	86.3	140	62.5	360	75.2
Yes	35	13.7	84	37.5	119	24.8

Had used psychoactive substance in the last year

No	233	91.4	162	72.3	395	82.5
Yes	22	8.6	62	27.7	84	17.5

HBM-related cognitions on substances use

Perceived Susceptibility Scale

I get in touch easily with people who use drugs

Strongly disagree / Disagree	198	77.6	126	56.2	324	67.6
Strongly agree / Agree	57	22.4	98	43.8	155	32.4

I often go to places where people use drugs

Strongly disagree / Disagree	219	85.9	159	71.0	378	78.9
Strongly agree / Agree	36	14.1	65	29.0	101	21.1

Perceived Severity Scale

Using drugs would strongly affect my appearance

Strongly disagree / Disagree	63	24.7	47	21.0	110	23.0
Strongly agree / Agree	192	75.3	177	79.0	369	77.0

Using drugs would strongly affect my intelligence

Strongly disagree / Disagree	30	11.8	39	17.4	69	14.4
Strongly agree / Agree	225	88.2	185	82.6	410	85.6

Using drugs would strongly affect my health

Strongly disagree / Disagree	20	7.8	30	13.4	50	10.4
Strongly agree / Agree	235	92.2	194	86.6	429	89.6

Perceived Benefit Scale

Using drugs would make me feel happy

Strongly disagree / Disagree	197	77.3	155	69.2	352	73.5
Strongly agree / Agree	58	22.7	69	30.8	127	26.5

Using drugs would reduce my stress

Strongly disagree / Disagree	210	82.4	139	72.9	349	72.9
Strongly agree / Agree	45	17.6	85	27.1	130	27.1

Using drugs would help me to get closer to my friends

Strongly disagree / Disagree	222	87.1	180	80.4	402	83.9
Strongly agree / Agree	33	12.9	44	19.6	77	16.1

Using drugs would help me to forget about unpleasant things in life such as unemployment.

Strongly disagree / Disagree	210	82.4	155	69.2	365	76.2
Strongly agree / Agree	45	17.6	69	30.8	114	23.8

Perceived Barriers

Using drugs may make me arrested

Strongly disagree / Disagree	32	12.5	32	14.3	64	13.4
Strongly agree / Agree	223	87.5	192	85.7	415	86.6

Using drugs is expensive

Strongly disagree / Disagree	89	34.9	91	40.6	180	37.6
Strongly agree / Agree	166	65.1	133	59.4	299	62.4

Cue to Action Scale

My friends would give me drugs						
Strongly disagree / Disagree	216	84.7	140	62.5	356	74.3
Strongly agree / Agree	39	15.3	84	37.5	123	25.7
My friends would ask me to use drugs						
Strongly disagree / Disagree	214	83.9	143	63.8	357	74.5
Strongly agree / Agree	41	16.1	81	36.2	122	25.5
<i>Perceived Self-efficacy Scale</i>						
I do not have any difficulty in using drugs						
Strongly disagree / Disagree	183	71.8	121	54.0	304	63.5
Strongly agree / Agree	72	28.2	103	46.0	175	36.5
I do not have any difficulty in getting drugs						
Strongly disagree / Disagree	184	72.2	106	47.3	290	60.5
Strongly agree / Agree	71	27.8	118	52.7	189	39.5
I can stop using drugs anytime if I want to						
Strongly disagree / Disagree	192	75.3	122	54.5	314	65.6
Strongly agree / Agree	63	24.7	102	45.5	165	34.4

1Depression is defined as depression subscale scores of DASS \geq 10

2Anxiety is defined as anxiety subscale scores of DASS \geq 8

Table 2 Intention to use psychoactive substances in the next 12 months

	Among all respondents (n=479)						Among never users (n=360)					
	Respondents recruited by phone survey		Respondents recruited from NGO or snowballing		All		Respondents recruited by phone survey		Respondents recruited from NGO or snowballing		All	
	n	%	n	%	n	%	n	%	n	%	n	%
Chance to use substances in the next 12 months												
Definitely Not	213	83.5	141	62.9%	354	73.9%	201	91.	116	82.9%	317	88.1%
Some Chance	23	9.0%	43	19.2%	66	13.8%	14	6.4	21	15.0%	35	9.7%
High Chance	12	4.7%	29	12.9%	41	8.6%	2	0.9	2	1.4%	4	1.1%
Definitely Yes	7	2.7%	11	4.9%	18	3.8%	3	1.4	1	0.7%	4	1.1%
	Among ever users (n=119)						Among users in the last 12 months (n=84)					
	Respondents recruited by phone survey		Respondents recruited from NGO or snowballing		All		Respondents recruited by phone survey		Respondents recruited from NGO or snowballing		All	
	n	%	n	%	n	%	n	%	n	%	n	%
Chance to use substances in the next 12 months												
Definitely Not	12	34.3%	25	29.8%	37	31.1%	3	13.6%	11	17.7%	14	16.7%
Some Chance	9	25.7%	22	26.2%	31	26.1%	6	27.3%	21	33.9%	27	32.1%
High Chance	10	28.6%	27	32.1%	37	31.1%	9	40.9%	24	38.7%	33	39.3%
Definitely Yes	4	11.4%	10	11.9%	14	11.8%	4	18.2%	6	9.7%	10	11.9%

Table 3 Profile of ever substance users (N=119) and users in the last 12 months (N=84).

	Ever users (N=119)		Users in the Last 12 months (N=84)	
	n	%	n	%
<u>Socio-demographic variables</u>				
Age group (years)				
15	10	8.4	8	9.5
16	15	12.6	13	15.5
17	27	22.7	19	22.6
18	16	13.4	11	13.1
19	19	16.0	11	13.1
20	10	8.4	7	8.3
21	5	4.2	2	2.4
22	7	5.9	4	4.8
23	5	4.2	4	4.8
24	5	4.2	5	6.0
Gender				
Male	74	62.2	50	59.5
Female	45	37.8	34	40.5
Education level				
F.3 or below	79	66.4	61	72.6
F.4-5	37	31.1	21	25.0
F.6 or above	3	2.5	2	2.4
Living with parents				
Both	78	65.5	52	61.9
Father only	7	5.9	6	7.1
Mother only	20	16.8	17	20.2
None	14	11.8	9	10.7
Having divorced parents				
Yes	34	28.6	26	31.0
No	85	71.4	58	69.0
Duration of stay in Hong Kong				
Below 1 year	0	0.0	0	0.0
1-4 years	0	0.0	0	0.0
5-10 years	8	6.7	7	8.3
Above 10 years or were born in HK	111	93.3	77	91.7
Family monthly income (US\$1=HK\$7.8)				
<8000	15	12.6	14	16.7
8000-24999	36	30.3	23	27.4
≥25000	15	12.6	13	15.5
Don't know	53	44.5	34	40.5

<u>Housing type</u>				
Private	17	14.3	13	15.5
Public	82	68.9	58	69.0
Home Ownership Scheme	10	8.4	7	8.3
Staff quarter	1	0.8	0	0.0
Others	9	7.6	6	7.1
<u>Variables related to engagement</u>				
Duration of non-engagement				
3-4 months (0-25 percentile)	29	24.4	16	19.0
5-6 months (26-50 percentile)	23	19.3	15	17.9
7-12 months (51-75 percentile)	33	27.7	23	27.4
More than 12 months (76-100 percentile)	34	28.6	30	35.7
Participation in any community activity currently				
No	68	57.1	47	56.0
Yes	51	42.9	37	44.0
<u>Distress due to non-engagement</u>				
Perceived financial pressure				
Very large / large	44	37.0	33	39.3
Small / none	75	63.0	51	60.7
Perceived family pressure				
Very large / large	59	49.6	45	53.6
Small / none	60	50.4	39	46.4
Disappointment due to non-engagement				
Very large / large	47	39.5	36	42.9
Small / none	72	60.5	48	57.1
No. of items related to distress due to non-engagement				
0	38	31.9	25	29.8
1	29	24.4	19	22.6
2	35	29.4	25	29.8
3	17	14.3	15	17.9
<u>Adverse experiences</u>				
Being frequently hit or received corporal punishment during childhood				
No / Don't know	43	36.1	25	29.8
Yes	76	63.9	59	70.2
Had ever been suspended by school				
No / Don't know	67	56.3	50	59.5
Yes	52	43.7	34	40.5
Had ever been arrested				
No / Don't know	40	33.6	29	34.5
Yes	79	66.4	55	65.5
At least one of the adverse experiences				
No / Don't know	14	11.8	10	11.9
Yes	105	88.2	74	88.1
<u>Psychological variables</u>				

Depression¹				
No	63	52.9	37	44.0
Yes	56	47.1	47	56.0
Anxiety²				
No	54	45.4	29	34.5
Yes	65	54.6	55	65.5
<u>Perceived availability of peer support</u>				
Available peer support on emotional problems				
Definitely no / Unlikely	17	14.3	13	15.5
Definitely yes / Likely	102	85.7	71	84.5
Available peer support on financial problems				
Definitely no / Unlikely	33	27.7	22	26.2
Definitely yes / Likely	86	72.3	62	73.8
Number of items indicating availability of peer support				
0	8	6.7	4	4.8
1	34	28.6	27	32.1
2	77	64.7	53	63.1
<u>Family support</u>				
Being cared by family member				
No / Not sure	39	32.8	29	34.5
Yes	80	67.2	55	65.5
Family members show understandings				
No / Not sure	74	62.2	54	64.3
Yes	45	37.8	30	35.7
Family members are willing to help				
No / Not sure	40	33.6	29	34.5
Yes	79	66.4	55	65.5
Good relationship with family member				
No / Not sure	55	46.2	42	50.0
Yes	64	53.8	42	50.0
Number of items indicating family support				
0	24	20.2	19	22.6
1-2	35	29.4	25	29.8
3-4	60	50.4	40	47.6
<u>Peer influences over substance use</u>				
Having friends who are substance users				
None	6	5.0	0	0.0
Some of them	49	41.2	31	36.9
Many of them	60	50.4	51	60.7
All	4	3.4	2	2.4
Having close relationship with substance users				
No and no such friends	36	30.3	22	26.2
Yes	83	69.7	62	73.8
Having been suggested by friends to use substances				
No / don't know / No such friends	38	31.9	20	23.8
Yes	81	68.1	64	76.2

Having been suggested by friends via the internet to use substance

No / not sure	96	80.7	65	77.4
Yes	23	19.3	19	22.6

HBM-related cognitions on substances use

Perceived Susceptibility Scale

I get in touch easily with people who use drugs

Strongly disagree / Disagree	30	25.2	15	17.9
Strongly agree / Agree	89	74.8	69	82.1

I often go to places where people use drugs

Strongly disagree / Disagree	53	44.5	27	32.1
Strongly agree / Agree	66	55.5	57	67.9

Perceived Severity Scale

Using drugs would strongly affect my appearance

Strongly disagree / Disagree	42	35.3	27	32.1
Strongly agree / Agree	77	64.7	57	67.9

Using drugs would strongly affect my intelligence

Strongly disagree / Disagree	34	28.6	28	33.3
Strongly agree / Agree	85	71.4	56	66.7

Using drugs would strongly affect my health

Strongly disagree / Disagree	29	24.4	25	29.8
Strongly agree / Agree	90	75.6	59	70.2

Perceived Benefit Scale

Using drugs would make me feel happy

Strongly disagree / Disagree	51	42.9	33	39.3
Strongly agree / Agree	68	57.1	51	60.7

Using drugs would reduce my stress

Strongly disagree / Disagree	43	36.1	26	31.0
Strongly agree / Agree	76	63.9	58	69.0

Using drugs would help me to get closer to my friends

Strongly disagree / Disagree	68	57.1	44	52.4
Strongly agree / Agree	51	42.9	40	47.6

Using drugs would help me to forget about unpleasant things in life such as unemployment.

Strongly disagree / Disagree	50	42.0	32	38.1
Strongly agree / Agree	69	58.0	52	61.9

Perceived Barriers

Using drugs may make me arrested

Strongly disagree / Disagree	28	23.5	24	28.6
Strongly agree / Agree	91	76.5	60	71.4

Using drugs is expensive

Strongly disagree / Disagree	78	65.5	53	63.1
Strongly agree / Agree	41	34.5	31	36.9

Cue to Action Scale

My friends would give me drugs

Strongly disagree / Disagree	39	32.8	28	33.3
Strongly agree / Agree	80	67.2	56	66.7

My friends would ask me to use drugs				
Strongly disagree / Disagree	39	32.8	22	26.2
Strongly agree / Agree	80	67.2	62	73.8
<i>Perceived Self-efficacy Scale</i>				
I do not have any difficulty in using drugs				
Strongly disagree / Disagree	33	27.7	25	29.8
Strongly agree / Agree	86	72.3	59	70.2
I do not have any difficulty in getting drugs				
Strongly disagree / Disagree	28	23.5	20	23.8
Strongly agree / Agree	91	76.5	64	76.2
I can stop using drugs anytime if I want to				
Strongly disagree / Disagree	27	22.7	24	28.6
Strongly agree / Agree	92	77.3	60	71.4

1Depression is defined as depression subscale scores of DASS \geq 10

2Anxiety is defined as anxiety subscale scores of DASS \geq 8

Table 4 History and pattern of psychoactive substance use (Among ever substances users, n=119 and among those using substances in the last 12 months, n=84)

	Among ever users (n=119)						Among users in the last 12 months (n=84)					
	Respondents recruited by phone survey		Respondents recruited from NGO or snowballing		All		Respondents recruited by phone survey		Respondents recruited from NGO or snowballing		All	
	n	%	n	%	n	%	n	%	n	%	n	%
<u>History of psychoactive substances use</u>												
Age at first use (years)												
11-12	3	8.6%	11	13.1%	14	11.8%	2	9.1%	9	14.5%	11	13.1%
13-14	9	25.7%	43	51.2%	52	43.7%	4	18.2%	32	51.6%	36	42.9%
15-16	17	48.6%	26	31.0%	43	36.1%	12	54.5%	19	30.6%	31	36.9%
17-19	6	17.1%	4	4.8%	10	8.4%	4	18.2%	2	3.2%	6	7.1%
Had used psychoactive substances in the last 12 months												
No	13	37.1%	22	26.2%	35	29.4%	-	-	-	-	-	-
Yes	22	62.9%	62	73.8%	84	70.6%	-	-	-	-	-	-
Frequency of substance use in the last month												
Nil	13	37.1%	22	26.2%	35	29.4%	0	0.0%	0	0.0%	0	0.0%
1-2 times	8	22.9%	16	19.0%	24	20.2%	8	36.4%	16	25.8%	24	28.6%
3-5 times	6	17.1%	23	27.4%	29	24.4%	6	27.3%	23	37.1%	29	34.5%
6-10 times	4	11.4%	8	9.5%	12	10.1%	4	18.2%	8	12.9%	12	14.3%
11-20 times	2	5.7%	5	6.0%	7	5.9%	2	9.1%	5	8.1%	7	8.3%
>20 times	2	5.7%	10	11.9%	12	10.1%	2	9.1%	10	16.1%	12	14.3%
Type of substances used in the last month												
1	8	22.9%	19	22.6%	27	22.7%	5	22.7%	13	21.0%	18	21.4%
2	5	14.3%	18	21.4%	23	19.3%	3	13.6%	9	14.5%	12	14.3%
3	6	17.1%	11	13.1%	17	14.3%	6	27.3%	10	16.1%	16	19.0%
>3	16	45.7%	36	42.9%	52	43.7%	8	36.4%	30	48.4%	38	45.2%
<u>Pattern of substance use (in the last 6 months)</u>												
Had used multiple types of substances simultaneously												
No / don't know	22	62.9%	49	58.3%	71	59.7%	12	54.5%	27	43.5%	39	46.4%

Yes	13	37.1%	35	41.7%	48	40.3%	10	45.5%	35	56.5%	45	53.6%
Had used substances together with alcohol												
No / don't know	19	54.3%	44	52.4%	63	52.9%	10	45.5%	25	40.3%	35	41.7%
Yes	16	45.7%	40	47.6%	56	47.1%	12	54.5%	37	59.7%	49	58.3%
Had used substances in mainland China												
No / don't know	23	65.7%	59	70.2%	82	68.9%	13	59.1%	37	59.7%	50	59.5%
Yes	12	34.3%	25	29.8%	37	31.1%	9	40.9%	25	40.3%	34	40.5%
Had obtained substance via the internet												
No / not sure	32	91.4%	80	95.2%	112	94.1%	19	86.4%	58	93.5%	77	91.7%
Yes	3	8.6%	4	4.8%	7	5.9%	3	13.6%	4	6.5%	7	8.3%
Discomfort due to psychoactive substance use in the last month												
No discomfort	23	65.7%	58	69.0%	81	68.1%	11	50.0%	36	58.1%	47	56.0%
Mild / not severe	4	11.4%	7	8.3%	11	9.2%	4	18.2%	7	11.3%	11	13.1%
Moderate	3	8.6%	13	15.5%	16	13.4%	2	9.1%	13	21.0%	15	17.9%
Very severe / severe	5	14.3%	6	7.1%	11	9.2%	5	22.7%	6	9.7%	11	13.1%
Performed illegal activities due to substance use												
No / refuse to answer	31	88.6%	74	88.1%	105	88.2%	20	90.9%	53	85.5%	73	86.9%
Yes	4	11.4%	10	11.9%	14	11.8%	2	9.1%	9	14.5%	11	13.1%
<u>Help seeking to deal with substance use problem</u>												
Whether sought help from others												
No	25	71.4%	64	76.2%	89	74.8%	18	81.8%	47	75.8%	65	77.4%
Yes	10	28.6%	20	23.8%	30	25.2%	4	18.2%	15	24.2%	19	22.6%
Type of helpers												
Parents	0	0.0%	3	3.6%	3	2.5%	0	0.0%	3	4.8%	3	3.6%
Siblings	1	2.9%	3	3.6%	4	3.4%	1	4.5%	3	4.8%	4	4.8%
Social worker	8	22.9%	17	20.2%	25	21.0%	2	9.1%	12	19.4%	14	16.7%
Teacher	0	0.0%	1	1.2%	1	0.8%	0	0.0%	1	1.6%	1	1.2%
Friends	3	8.6%	14	16.7%	17	14.3%	2	9.1%	12	19.4%	14	16.7%
Hotline	0	0.0%	1	1.2%	1	0.8%	0	0.0%	1	1.6%	1	1.2%
Internet	1	2.9%	1	1.2%	2	1.7%	1	4.5%	1	1.6%	2	2.4%

Table 5 Prevalence of using specific types of psychoactive substances

	<u>Among all respondents (n=479)</u>		<u>Among ever users (n=119)</u>		<u>Among users in the last 12 months (n=84)</u>	
	Lifetime use (%)	Used in the last year (%)	Lifetime use (%)	Used in the last year (%)	Lifetime use (%)	Used in the last year (%)
Ketamine	22.1	12.3	89.1	49.6	88.1	70.2
Methylamphetamine	11.9	6.9	47.9	27.7	51.2	39.3
Cocaine	15.0	10.0	60.5	40.3	65.5	57.1
Cannabis	11.3	4.4	45.4	17.6	46.4	25.0
Ecstasy	7.3	2.1	29.4	8.4	29.8	11.9
Nimetazepam	9.4	3.8	37.8	15.1	39.3	21.4
Flunitrazepam	1.0	0.2	4.2	0.8	2.4	1.2
Cough Medicines	4.0	2.7	16.0	10.9	16.7	15.5
Others	0.4	0.0	1.7	0.0	1.2	0.0

Table 6 Frequency of using specific types of substances in the last month

	Among ever users (n=119)			Among users in the last 12 months (n=84)		
	0 time (%)	1-2 times (%)	≥3 times (%)	0 time (%)	1-2 times (%)	≥3 times (%)
Ketamine	50.4	26.9	22.7	29.8	38.1	32.1
Methylamphetamine	72.3	21.8	5.9	60.7	31.0	8.3
Cocaine	59.7	24.4	16.0	42.9	34.5	22.6
Cannabis	82.4	13.4	4.2	75.0	19.0	6.0
Ecstasy	91.6	5.9	2.5	88.1	8.3	3.6
Nimetazepam	84.9	12.6	2.5	78.6	17.9	3.6
Flunitrazepam	99.2	0.0	0.8	98.8	0.0	1.2
Cough Medicines	89.1	5.9	5.0	84.5	8.3	7.1
Others	100.0	0.0	0.0	100.0	0.0	0.0

Table 7 Frequency distribution of variables related to cessation of psychoactive substance use (Among ever substance users, n=119 and among substance users in the last 12 months, n=84)

	Ever users		Users in the last 12 months	
	n	%	n	%
<u>Variables related to cessation services</u>				
Whether know about the cessation services				
No	61	51.3%	42	50.0%
Yes	58	48.7%	42	50.0%
Ever used cessation services				
No / Don't know the service	96	80.7%	65	77.4%
Yes	23	19.3%	19	22.6%
Barriers preventing utilization of cessation services (among those who know of cessation services)				
Loss of freedom	24	41.4%	19	45.2%
Perceived inappropriateness of such services him/her	19	32.8%	15	35.7%
Fear of being arrested	11	19.0%	8	19.0%
Do not know where to obtain such services	4	6.9%	3	7.1%
Not familiar with such services	7	12.1%	5	11.9%
Discomfort	9	15.5%	9	21.4%
Fear of letting family members knowing about his/her substance use	8	13.8%	6	14.3%
Others	7	12.1%	4	9.5%
Perceived efficacy of cessation services (among those who know of cessation services)				
No / don't know	33	56.9%	24	57.1%
Yes	25	43.1%	18	42.9%
<u>Experience of relapse</u>				
Whether relapse after trying to quit psychoactive substance use				
No	56	47.1%	32	38.1%
Yes	63	52.9%	52	61.9%
<u>Perceptions related to cessation of substance use</u>				
<i>Positive attitudes:</i>				
After quitting substance use, it would be easier for me to find a job				
No	53	44.5%	39	46.4%
Yes	66	55.5%	45	53.6%
After quitting substance use, it would improve the relationship with my family members				
No	47	39.5%	37	44.0%
Yes	72	60.5%	47	56.0%
<i>Negative attitudes:</i>				
After quitting substance use, I would lose some important friends				
No	89	74.8%	62	73.8%
Yes	30	25.2%	22	26.2%
After quitting substance use, I would gain weight				
No	73	61.3%	51	60.7%
Yes	46	38.7%	33	39.3%
<i>Subjective norms:</i>				

My friends would encourage me to quit substance use				
No	41	34.5%	31	36.9%
Yes	78	65.5%	53	63.1%
<i>Perceived behavioral change:</i>				
It is within my control whether I want to quit substance use				
No	31	26.1%	26	31.0%
Yes	88	73.9%	58	69.0%

Table 8 Fear and perceived effectiveness related to themes of API and slogans used in anti-drug campaigns

	<u>Level of fear (0-10)</u>			<u>Perceived effectiveness in preventing you from using substances (0-10)</u>		
	0-2	3-6	7-10	0-2	3-6	7-10
	(%)	(%)	(%)	(%)	(%)	(%)
<u>Themes of API</u>						
1. Drugs cause deaths (有可能引致死亡)	21.3	41.3	37.4	21.5	39.9	38.6
2. Drugs lead to frequent urination (會尿頻)	14.8	49.1	36.1	18.0	43.2	38.8
3. Drugs damage the nerves of the brain (會令大腦神經受損害)	12.5	40.1	47.4	14.6	39.5	45.9
4. Taking drugs make one' s family feel hurt (會令家人傷心)	15.2	33.6	51.1	15.8	36.1	48.1
5. Taking drugs destroy one' s future (會毀掉前途)	15.9	34.9	49.3	18.8	35.9	45.3
<u>Slogans of anti-drug campaigns</u>						
6. "Life has no second chance" (生命冇 take two)	19.4	37.8	42.8	20.9	38.8	40.3
7. "No drugs No regrets Not Now Not Ever" (不可一不可再)	28.6	39.2	32.25	27.8	41.5	30.7
8. "Be Smart Be Free" (天造之才，不進迷陣)	37.8	41.5	20.7	38.6	39.5	21.9
9. "Drugs? No Way!" (向毒品說不)	32.8	39.0	28.2	31.3	41.3	27.3

Table 9 Background factors associated with ever use of psychoactive substances (Among all respondents, n=479)

	% Ever use of substances	Univariate OR (95% CI)	Multivariate OR (95% CI)
<u>Socio-demographic variables</u>			
Age group			
15-18	30.1	1.00	
19-24	20.2	0.59 (0.39, 0.89)*	-
Education level			
F.3 or below	46.2	1.00	1.00
F.4-5	19.8	0.29 (0.18, 0.46)***	0.29(0.18, 0.46)***
F.6 or above	2.5	0.03 (0.01, 0.10)***	0.03(0.01, 0.10)***
Family monthly income			
<8000	42.9	1.00	
8000-24999	19.1	0.32 (0.15, 0.68)**	-
>=25000	21.7	0.37 (0.15, 0.89)*	-
Don't know	28.3	0.53 (0.25, 1.11)	-
Housing type			
Private	16.7	1.00	
Public	29.0	2.04 (1.14, 3.65)*	-
Home Ownership Scheme	17.5	1.06 (0.45, 2.51)	-
Staff quarter	33.3	2.50 (0.21, 29.15)	-
Others	26.5	1.80 (0.72, 4.53)	-
<u>Mode of recruitment</u>			
Phone	13.7	1.00	
NGO/Peer referral	37.5	3.77 (2.41, 5.90)***	-

*** p<0.001, ** p<.001, * p<0.05

Factors that were non-significant in the univariate analysis were not tabulated (including gender, whether living with parents, whether have divorced parents, duration of stay in Hong Kong). Multivariate OR: stepwise forward logistic regression using those variables that were significant in the univariate analysis as candidates for selection.

Table 10 Adjusted analysis of factors associated with ever use of psychoactive substances (Among all respondents, n=479)

	Ever use of substances (%)	Univariate OR (95% CI)	Adjusted OR by education level (95% CI)	Multivariate OR (95% CI)
<u>Variables related to engagement</u>				
Duration of non-engagement (months)				
3-4 months (0-25 percentile)	16.6	1.00	1.00	
5-6 months (26-50 percentile)	18.3	1.12 (0.62, 2.05)	1.30 (0.68,2.48)	-
7-12 months (51-75 percentile)	33.7	2.56 (1.43, 4.56)**	1.95 (1.05,3.62)*	-
More than 12 months (76-100)	42.5	3.72 (2.05, 6.75)***	2.82 (1.48,5.37)**	-
<u>Distress due to non-engagement</u>				
Perceived family pressure				
Small / none	19.6	1.00	1.00	
Very large / large	34.1	2.12 (1.39, 3.24)***	1.74 (1.10,2.75)*	-
Disappointment due to non-engagement				
Small / none	22.2	1.00	1.00	
Very large / large	30.5	1.54 (1.00, 2.38)*	1.21 (0.75,1.94)	-
<u>Previous adverse experiences</u>				
Being frequently hit or received corporal punishment during childhood				
No / Don't know	15.2	1.00	1.00	
Yes	38.8	3.54 (2.29, 5.45)***	2.52 (1.58,4.02)***	-
Had ever been suspended by school				
No / Don't know	16.8	1.00	1.00	
Yes	65.8	9.57 (5.61, 16.33)***	6.19 (3.51,10.90)***	-
Had ever been arrested				
No / Don't know	11.5	1.00	1.00	1.00
Yes	60.3	11.70 (7.23, 18.92)***	6.78 (4.07,11.30)***	4.12 (1.84,9.25)**

<u>Resilience</u>				
Resilience Attribution Scale ¹	-	0.96 (0.94, 0.98)***	0.98 (0.96,1.00)	-
<u>Perceived availability of peer support</u>				
Perceived available peer emotional				
Definitely no / Unlikely	16.7	1.00	1.00	1.00
Definitely yes / Likely	27.1	1.86 (1.05, 3.27)*	1.51 (0.82,2.79)	5.27 (1.60,17.34)**
Perceived available peer financial				
Definitely no / Unlikely	18.5	1.00	1.00	
Definitely yes / Likely	28.6	1.76 (1.12, 2.77)*	1.17 (0.71,1.93)	-
<u>Family support</u>				
Being cared by family member				
No / Not sure	41.5	1.00	1.00	
Yes	20.8	0.37 (0.23, 0.60)***	0.54 (0.32,0.91)*	-
Family members show understandings				
No / Not sure	30.1	1.00	1.00	
Yes	19.3	0.56 (0.36, 0.85)**	0.85 (0.53,1.35)	-
Family members are willing to help				
No / Not sure	54.1	1.00	1.00	
Yes	19.5	0.21 (0.12, 0.35)***	0.33 (0.19,0.58)***	-
Good relationship with family member				
No / Not sure	39.3	1.00	1.00	
Yes	18.9	0.36 (0.23, 0.56)***	0.51 (0.32,0.83)**	-
<u>Peer influences over substances use</u>				
Having friends who are substance users				
None / some of them	13.6	1.00	1.00	1.00
Many / all of them	86.5	40.73(19.73,84.05)***	34.89 (15.38,79.15)***	15.72(5.39,45.88)***
Having been suggested by friends to use substances				
No	26.7	1.00	1.00	

Yes	72.3	7.19 (4.03,12.82)***	6.48 (3.55,11.83)***	-
Having been suggested by friends via the internet to use substances				
No	22.3	1.00	1.00	
Yes	47.9	3.21 (1.74, 5.91)***	3.68 (1.78,7.60)***	-
<u>Psychological problems</u>				
Loneliness or Social Isolation Scale ²	-	0.94 (0.90, 0.99)**	0.96 (0.92,1.00)	-
DASS-anxiety ³	-	1.27 (1.19, 1.36)***	1.19 (1.11,1.28)***	-
DASS-Depression ⁴	-	1.19 (1.13, 1.26)***	1.13 (1.07,1.20)***	-
DASS-Stress ⁵	-	1.16 (1.11, 1.22)***	1.12 (1.06,1.18)***	-
<u>Cognitive factors related to drug use</u>				
Perceived Susceptibility Scale ⁶	-	2.33 (1.99, 2.73)***	2.16 (1.83,2.55)***	-
Perceived Benefit Scale ⁷	-	1.56 (1.41, 1.73)***	1.51 (1.36,1.67)***	1.30 (1.13,1.50)***
Barrier – worry about being arrested	-	0.67 (0.53, 0.84)**	0.63 (0.48,0.82)**	-
Barrier – high cost	-	0.48 (0.38, 0.60)***	0.48 (0.38,0.62)***	0.61 (0.40,0.94)*
Cue to Action Scale ⁸	-	2.28 (1.94, 2.68)***	2.01 (1.71,2.37)***	-
Perceived Self-efficacy Scale ⁹	-	1.82 (1.61, 2.05)***	1.70 (1.50,1.92)***	1.49 (1.22,1.81)***
<u>Themes and slogans of anti-drug</u>				
Induced Fear Scale ¹⁰	-	0.98 (0.97, 0.99)***	0.98 (0.97,0.99)***	-
Perceived Efficacy Scale ¹¹	-	0.98 (0.97, 0.98)***	0.98 (0.97,0.99)***	-

*** p<0.001, ** p<.001, * p<0.05

All variables in Table 1 (except those on substance use behaviors and intentions) were considered in the univariate analysis, only those with significant results in the univariate analysis were tabulated in this table.

Adjusted OR: Stepwise forward logistic regression using those variables that were significant in the ORu models as candidates for selection, after adjusting by education level (enter).

1 Resilience Attribution Scale (Alpha=0.73, no. of items=9, Range=0-10. Lower score indicates lower resilience)

2 Loneliness or Social Isolation Scale (Alpha=0.82, no. of items =8, Range=1-4. Lower score indicates more loneliness)

3 DASS-Anxiety (Alpha=0.77, no. of items =7, Range=0-Higher score indicates more anxiety)

4 DASS-Depression (Alpha=0.85, no. of items =7, Range=0-3, Higher score indicates more depressed)

5 DASS-Stress (Alpha=0.83, no. of items =7, Range=0-3, Higher score indicates more stress)

6 Perceived Susceptibility Scale (Alpha=0.85, no. of items =2, Range=1-4, Higher score indicates unfavorable result)

7 Perceived Benefit Scale (Alpha=0.89, no. of items =4, Range=1-4, Higher score indicates unfavorable result)

8 Cue to Action Scale (Alpha=0.91, no. of items =2, Range=1-4, Higher score indicates unfavorable result)

- 9 Perceived Self-efficacy Scale (Alpha=0.82, no. of items =3, Range=1-4, Higher score indicates unfavorable result)
- 10 Induced Fear Scale (Alpha=0.93, no. of items =9, Range=0-10, Higher score indicates more fear)
- 11 Perceived Efficacy Scale of (Alpha=0.85, no. of items =9, Range=0-10, Higher score indicates more effective)

Table 11 Background factors associated with intention to use psychoactive substances in the next 12 months (Among all respondents who had never used psychoactive substances, n=360)

	#Intended to use psychoactive substances in the next year (%)	Univariate OR (95% CI)	Multivariate OR (95% CI)
<u>Socio-demographic variables</u>			
Age group			
15-18	15.8	1.00	
19-24	8.9	0.52 (0.27,0.99)*	-
Education level			
F.3 or below	19.6	1.00	
F.4-5	10.0	0.46 (0.22,0.96)*	-
F.6 or above	8.5	0.38 (0.17,0.87)*	-
Living with parent(s)			
Both	9.7	1.00	
Father only	25.0	3.10 (0.79,12.14)	-
Mother only	15.6	1.71 (0.710,4.21)	-
None	24.0	2.94 (1.08,7.98)*	-
Having divorced parents			
No	9.6	1.00	
Yes	20.5	2.44 (1.24,4.80)*	2.12 (1.06,4.25)*
<u>Mode of recruitment</u>			
Phone	8.6	1.00	
NGO/Peer referral	17.1	2.19 (1.15,4.17)*	-

*** p<0.001, ** p<.001, * p<0.05

Non-significant socio-demographic variables were not tabulated (Gender, duration of stay in Hong Kong, family monthly income, housing type)

Absolute no chance versus some/large/absolute chance to use psychoactive substances in the next year

Multivariate OR: Stepwise forward logistic regression using those variables that were significant in the univariate analysis as candidates for selection.

Table 12 Adjusted analysis of factors associated with intention to use substances in the next 12 months (Among all respondents who had never used substances, n=360)

	[#] Intend to use psychoactive substances in the	Univariate OR (95% CI)	Adjusted OR by having divorced parents (95% CI)	Multivariate OR (95% CI)
<u>Variables related to engagement</u>				
Duration of non-engagement (months)				
3-4 months (0-25 percentile)	8.9	1.00	1.00	
5-6 months (26-50 percentile)	8.7	0.98 (0.40,2.39)	1.06 (0.43,2.61)	-
7-12 months (51-75 percentile)	20.0	2.56 (1.11,5.88)*	2.61 (1.13,6.07)*	-
More than 12 months (76-100)	17.4	2.15 (0.83,5.58)	2.08 (0.80,5.45)	-
<u>Distress due to non-engagement</u>				
Perceived financial pressure				
Small / none	9.3	1.00	1.00	
Very large / large	16.5	1.94 (1.02,3.69)*	1.99 (1.04,3.81)*	-
Perceived family pressure				
Small / none	9.3	1.00	1.00	
Very large / large	17.5	2.06 (1.08,3.94)*	1.85 (0.96,3.58)	-
Disappointment due to non-engagement				
Small / none	6.7	1.00	1.00	1.00
Very large / large	24.3	4.46 (2.30,8.63)***	4.26 (2.19,8.30)***	6.81(2.45,18.92)***
<u>Previous adverse experiences</u>				
Frequently being hit or received corporal punishment during childhood				
No / Don't know	9.2	1.00	1.00	
Yes	17.5	2.10 (1.11,4.00)*	1.94 (1.01,3.72)*	-
Had ever been suspended by school				
No / Don't know	9.6	1.00	1.00	
Yes	40.7	6.47 (2.77,15.13)***	6.27 (2.64,14.89)***	-
<u>On probationary sentence</u>				
Never	9.9	1.00	1.00	
Yes- previously	18.0	2.00 (1.02,3.93)*	1.89 (0.96,3.75)	-

Yes- current	12.5	1.30 (0.15,11.00)	1.42 (0.17,12.16)	-
<u>Resilience</u>				
Resilience Attribution Scale	-	0.96 (0.93, 0.99)**	0.96 (0.93, 0.99)*	-
<u>Perceived availability of peer support</u>				
Availability of peer financial support				
Definitely no / Unlikely	5.5	1.00	1.00	
Definitely yes / Likely	16.3	3.33 (1.50,7.41)**	3.09 (1.38,6.92)**	-
<u>Family support</u>				
Being cared by family members				
No / Not sure	20.0	1.00	1.00	
Yes	10.5	0.47 (0.22,1.00)*	0.57 (0.26,1.24)	-
Good relationship with family members				
No / Not sure	20.0	1.00	1.00	
Yes	9.5	0.42 (0.21,0.81)*	0.48 (0.24,0.96)*	-
<u>Peer influences over substance use</u>				
Having been suggested by friends to use psychoactive substances				
No	15.9	1.00	1.00	1.00
Yes	45.2	4.35 (1.75,10.81)**	4.25 (1.69,10.67)**	5.44(1.91,15.53)**
<u>Psychological problems</u>				
Loneliness or Social Isolation Scale	-	0.92 (0.86,0.99)*	0.93 (0.86,0.99)*	-
DASS-anxiety	-	1.20 (1.09,1.33)***	1.19 (1.08,1.32)**	-
DASS-Depression	-	1.17 (1.09,1.27)***	1.17 (1.08,1.26)***	-
DASS-Stress	-	1.14 (1.06,1.23)**	1.13 (1.05,1.22)**	-
<u>Cognitive factors related to drug use</u>				
Perceived Susceptibility Scale	-	1.53 (1.26,1.87)***	1.50 (1.23,1.84)***	-
Perceived Benefit Scale	-	1.31 (1.14,1.52)***	1.30 (1.13,1.50)***	-
Barrier – worry about being arrested	-	0.56 (0.40,0.79)**	0.56 (0.40,0.80)**	-
Barrier – high cost of substances	-	0.58 (0.42,0.80)**	0.58 (0.42,0.80)**	-
Cue to Action Scale	-	1.79 (1.44,2.21)***	1.74 (1.40,2.16)***	-
Perceived Self-efficacy Scale	-	1.35 (1.17,1.56)***	1.36 (1.18,1.58)***	-
<u>Emotional responses to drug use campaigns</u>				

Induced Fear Scale	-	0.98 (0.97,1.00)*	0.99 (0.97,1.00)	-
Perceived Efficacy Scale	-	0.98 (0.97,1.00)*	0.99 (0.97,1.00)	-

*** p<0.001, ** p<.001, * p<0.05

Absolutely no chance versus some/large/absolute chance to use psychoactive substances in the next year

Adjusted OR: Stepwise forward logistic regression using those variables that were significant in the univariate analysis as candidates for selection, adjusting for having divorced parents.

Table 13 Background factors associated with intended not to use psychoactive substances in the next 12 months (Among respondents who had used substances in the last 12 month, n=84)

	#Intended not to use substances in the next 12 months (%)	Univariate OR (95%CI)	Multivariate OR (95%CI)
<u>Socio-demographic variables</u>			
Age group (years)			
15-18	49.0	1.00	
19-24	48.5	0.98 (0.41,2.35)	
Gender			
Male	48.0	1.00	
Female	50.0	1.08 (0.45,2.59)	
Education level			
F.3 or below	44.3	1.00	
F.4-5	66.7	2.52 (0.89,7.12)	
F.6 or above	0.0	-	
Living with parent			
Both	50.0	1.00	
Father only	66.7	2.00 (0.34,11.89)	
Mother only	47.1	0.89 (0.30,2.66)	
None	33.3	0.50 (0.11,2.22)	
Divorced parent			
Yes	50.0	1.00	
No	48.3	0.93 (0.37,2.36)	
Family monthly income (HK\$)			
<8000	42.9	1.00	
8000-24999	43.5	1.03 (0.27,3.92)	
≥25000	61.5	2.13 (0.46,9.94)	
Don't know	50.0	1.33 (0.38,4.67)	
Housing type			
Private	38.5	1.00	
Public	55.2	1.97 (0.58,6.75)	
Home Ownership Scheme	14.3	0.27 (0.02,2.92)	
Others	50.0	1.60 (0.23,11.27)	
<u>Mode of recruitment</u>			
Phone	40.9	1.00	
NGO/Peer referral	51.6	1.54 (0.58,4.13)	

*** p<0.001, ** p<.001, * p<0.05

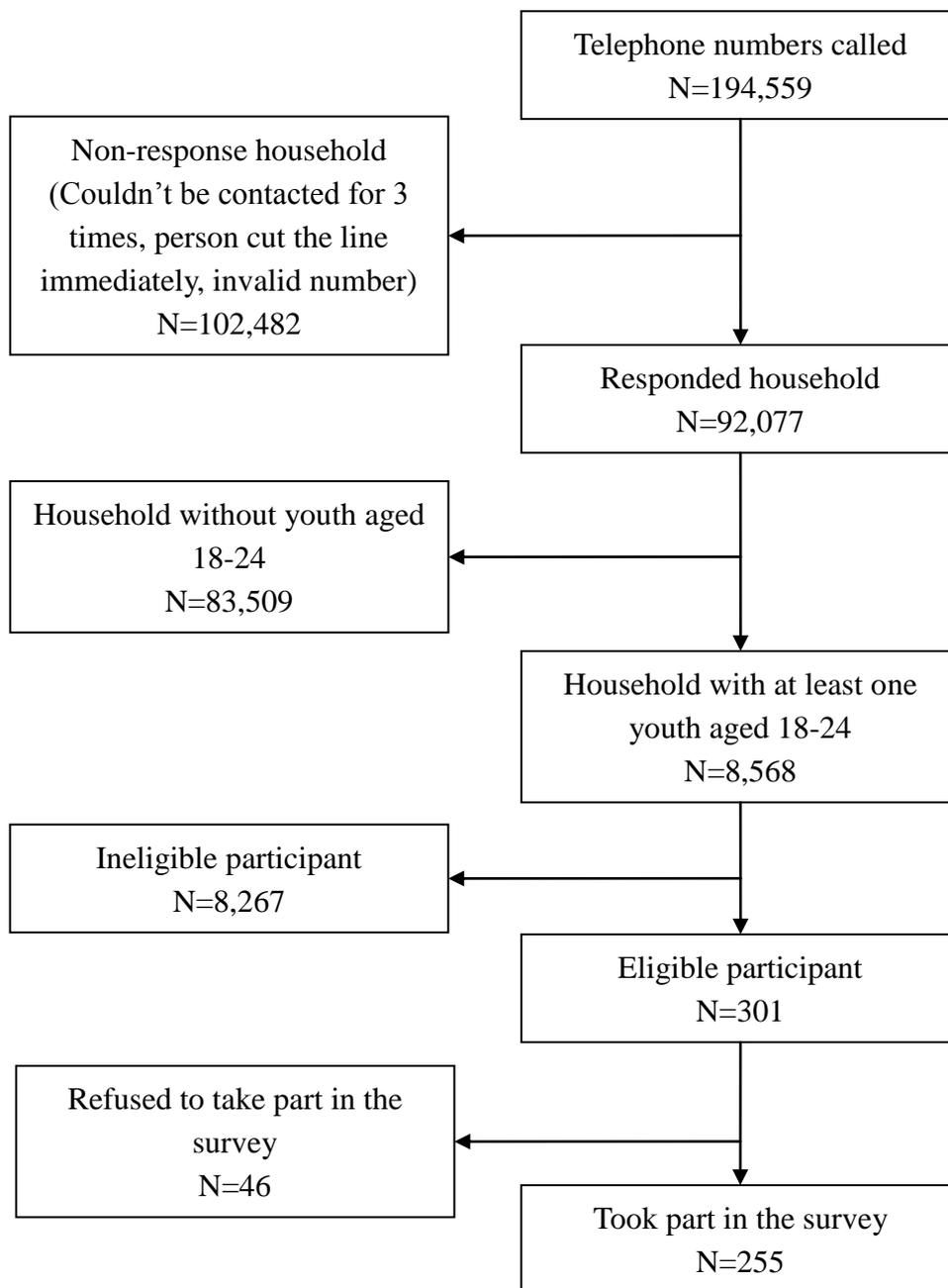
High chance/definitely versus no chance/unlikely to use substances in the next 12 months.

Multivariate OR: Stepwise forward logistic regression using those variables that were significant in the univariate analysis as candidates for selection.

Figure 1. Hong Kong youth unemployment rate (Index Mundi, 2011).

Year	Unemployment rate
2000	11.2
2001	11.2
2002	15.0
2003	15.0
2004	12.1
2005	10.7
2006	10.4
2007	9.0
2008	8.5
2009	12.6

Figure 2. Flow chart of the telephone survey



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Appendix 1

Participating Organization

1. Hong Kong Federation of Youth Group- Tsuen Wan Youth SPOT,
2. Hong Kong Federation of Youth Group- Jockey Club Youth SPOT,
3. Hong Kong Federation of Youth Group- Tsuen Wan and Kwai Chung Outreaching Social Work Team,
4. Hong Kong Federation of Youth Group- Sai Kung and Wong Tai Sin Outreaching Social Work Team,
5. Hong Kong Federation of Youth Group-Youth Support Scheme;
6. Chinese YMCA of Hong Kong -Shatin Outreaching Social Work Team
7. Yang Memorial Methodist Social Service Kowloon City District Youth Outreaching Social Service Centre
8. Hong Kong Children and Youth Services (Tai Po)
9. Hong Kong Christian Services- Yuen Long District Outreaching Social Work Team
10. Hong Kong Christian Services- Jockey Club Lodge of Rising Sun,
11. Hong Kong Christian Services-Withdrawn Youth Support Network Project,
12. Hong Kong Christian Services- Shamshuipo Central Integrated Children and Youth Service;
13. The Boys' & Girls' Club Association of Hong Kong Shamshuipo District Outreaching Social Work Team
14. Stewards Sha Kok Youth & Children Centre
15. Hong Kong PHAB Association Jockey Club Shatin Integrated Service Centre for Children & Youth
16. Hong Kong Playground Association- Midnight Outreaching Social Work Team
17. Hong Kong Playground Association- Nautica2.2 Liquid
18. Hong Kong Sheng Kung Hui Youth Employment Integrated Service Centre

Appendix 2

Efforts requesting NGOs to allow for snowballing recruitment of NEY through participants of the study

Intensive efforts have been made to negotiate with the NGOs for the purpose of snowballing recruitment, which are summarized below:

1. In the initial briefing to all participating NGOs, we presented the study design involving the snowballing part (Appendix 3). Requests were hence made to all the 18 participating NGOs for invite NEY participants to refer the friends to join this study.
2. After the meeting, most of the social workers fed back to us about the concern of liability issues. They felt uncomfortable about the referral recruitment strategy, even with the consent of their clients participating in our study. They were extremely worried that their clients would activate contacts with NEY, which might exert 'bad influences' onto their participants, as some of their NEY peers may be substance users or having behavioral problems. Social workers of 16 NGOs indicated that they would withdraw from the collaboration if the snowballing recruitment has to be implemented.
3. Hence, only 2 out of 18 NGOs agreed to let us invite the NEY participants through snowballing. A total of 15 cases were referred by the clients of the 2 NGOs.
4. Our project coordinator, Ms Tan Chow, visited these 16 refusing NGOs and met individually with the supervisors of the Centers during April to October 2011, to ask for reconsideration of their decision about snowballing. All the NGOs kept their firm position unchanged.
5. A letter requesting reconsideration of allowing for snowballing was sent to all the 16 NGOs. It stated clearly that this is an essential part of the study and the importance of using this sampling method (see Appendix 4).
6. The project coordinator paid another visit to each of the 16 NGOs during November 2011 to January 2012, to discuss about the request for reconsideration. All the 16 NGOs turned down the request. The research team respected their decisions and felt that we cannot push further.



香港中文大學
公共衛生及基層醫療學院
健康行為研究中心



<香港青少年就業與健康研究 2011> 研究程序

1. 背景及研究目的:

為了解香港待業待學青少年之濫用藥物狀況及其相關因素，禁毒處委託香港中文大學健康行為研究中心進行此項研究。

2. 受訪者條件:

- 年齡介乎 15-19 歲的青少年
- 在過去 3 個月或以上 沒有任何固定工作(全職或兼職)及沒有上學
- 現正接受 貴機構的服務 (例如: 青見、展翅或外展計劃)，並正有社工跟進
- 未曾參與過此項研究

3. 訪問形式、樣本數目及研究進行日期:

研究在 2011 年至 2012 年進行，在 NGO 內收集樣本，以不記名的問題形式在各參與機構訪問 20-30 名合資格的青少年 (可由多名社工轉介合資格受訪者，參與社工的數目由該機構自行決定)。此外，我們會邀請每位受訪者轉介合資格的朋友參加這項研究計劃。

4. 程序:

- 由參與機構的社工，邀請合資格的青少年參與本研究。
- 若成功邀請，請聯絡中文大學安排問卷訪問。
- 問卷訪問由中文大學的訪問員，到參與機構的中心內進行，訪問大約需要 15 分鐘。

5. 問卷內容:

問題主要有關受訪者的就業情況、生活模式、心理狀況及一些性質較敏感的資料(如可曾有濫用藥物)。

6. 感謝費:

每位成功完成問卷訪問的青少年，可獲得\$50 超級市場現金卷以作感謝。

7. 查詢及聯絡:

香港中文大學健康行為研究中心

研究員: 周小姐 (電話: 2635-1427)

Appendix 4



FACULTY OF MEDICINE
THE CHINESE UNIVERSITY OF HONG KONG



Centre for Health Behaviours Research

School of Public Health and Primary Care
5/F, Prince of Wales Hospital
Shatin, N.T., Hong Kong
<http://www.sphpc.cuhk.edu.hk>

November 5, 2011

Dear Sir/Madam:

Letter of Invitation (snowball)

Thank you for your support in recruiting participants aged 15-19 neither schooled or employed for the past three months to join our research project entitled “Drug Abuse Situation and Service Needs of Non-Engaged Youths (NEY) in Hong Kong” 『香港青少年就業與健康研究 2011』. We hope that the results of the Project will be useful to social workers and health workers.

As discussed, this research project includes snowball sampling as a supplementary method to recruit NEY, who may not currently be served by any social service agencies. This would extend our understanding on the NEY group. We planned in the proposal to have the participants referred by your team to nominate their friends, who are also NEY to join this study. A cash coupon of \$50 will be given to the nominators and nominees as a token of appreciation. Once our interviewer gets the contact information of the nominated participants, he/she will make an appointment with their nominees for interviews.

We fully understand there may be some difficulties in arranging such referrals of NEY through your clients. We wish that this option can be considered by your team. Your support is essential to the success and is very much appreciated. We fully respect your views and final decisions and would like to have another discussion with you about the possibility.

Should you have any questions or encounter any difficulties in recruitment, please contact Ms Tan Chow, research coordinator, at tanchow@cuhk.edu.hk or 2635-1427. Thank you for your assistance.

Sincerely,

Joseph T.F. Lau, MA Ph.D. FFPH (UK)
Associate Director, School of Public Health and Primary Care
Head, Division of Health Improvement
Director, Centre for Health Behaviours Research
The Chinese University of Hong Kong

Appendix 5

Association between independent variables and ever use of drugs for the phone-based and service-based group.

Independent variable	Phone-based group (n=255) OR	Service-based group (n=224) OR	All (n=479) AOR
<u>Variables related to engagement</u>			
Duration of non-engagement			
3-4 months (0-25 percentile)	1	1	1
5-6 months (26-50 percentile)	0.857	2.283*	1.474**
7-12 months (51-75 percentile)	2.314	2.561*	2.481***
>12 months (76-100 percentile)	7.547***	2.441*	3.993***
<u>Distress due to non-engagement</u>			
Perceived family pressure			
Small/None	1	1	1
Very Large/Large	2.252*	1.857*	1.993**
Disappointment at yourself			
Small/None	1	1	1
Very Large/Large	1.481	1.159	1.256
<u>Previous adverse experiences</u>			
Being frequently hit/received corporal punishment during childhood			
No/No not know	1	1	1
Yes	5.906***	1.749*	2.727***
Ever been suspended by school			
No/No not know	1	1	1
Yes	19.743***	5.083***	8.229***
Ever been arrested			
No/No not know	1	1	1
Yes	53.500***	4.559***	9.427***
Probationary service			
Never used	1	1	1
Yes, used previously	14.096***	1.451	2.967***
Yes, use currently	7.960**	5.149*	6.402***
<u>Social factors</u>			
Supported by friends			
Definitely no/Unlikely	1	1	1
Definitely yes/Likely	1.946	0.757	1.253
Supported by friends financially			

Definitely no/Unlikely	1	1	1
Definitely yes/Likely	1.994	0.73	1.159
<u>Family factors</u>			
Being cared by family member			
No/Not sure	1	1	1
Yes	0.370*	0.491*	0.448**
Family members show understanding			
No/Do not know	1	1	1
Yes	0.379*	0.98	0.686
Family members are willing to help			
No/Do not know	1	1	1
Yes	0.130***	0.333**	0.238***
Good relationship with family member			
No/Do not know	1	1	1
Yes	0.280***	0.511*	0.412***
<u>Peer influences over substances use</u>			
Having friends who are substances users			
None/Some of them	1	1	1
Many/All of them	45.529***	32.684***	38.131***
Having been suggested by friends to use substances			
No	1	1	1
Yes	6.923***	7.653****	7.411***
Having been suggested by friends to use substances <i>via Internet</i>			
No	1	1	1
Yes	3.538**	3.587**	3.563***
<u>Psychological problems</u>			
Resilience Attribution Scale	0.910***	0.986	0.963***
Loneliness/Social Isolation Scale	0.895*	0.977	0.956*
Dass-anxiety	1.388***	1.173***	1.225***
Dass-Depression	1.189**	1.136***	1.150***
Dass-Stress	1.143**	1.127***	1.132***
Hostility scale	1.303***	1.160***	1.205***
<u>Cognitive factors related to drug use</u>			
Perceived Susceptibility Scale	2.280***	2.277***	2.278***
Perceived Benefit Scale	1.757***	1.479***	1.556***
Barrier – worry about being arrested	0.638*	0.629**	0.633***
Barrier – high cost	0.360***	0.514***	0.451***
Cue to action Scale	2.504***	2.038***	2.193***
Perceived Self-efficacy Scale	1.578***	1.953***	1.766***

Themes and slogans of anti-drug			
Induced fear Scale	0.960***	0.986*	0.979***
Perceived efficacy Scale	0.958***	0.980***	0.974***

*<.05, **<.01, ***<.001. OR=odds ratio, AOR=adjusted odds ratio (adjusted for mode of recruitment)