

Final Report

on

**The Path-finding Adventure Project (PAP) - a pilot integrated
non-labeling secondary prevention program for secondary
students at high-risk of substance user using a screening
questionnaire
(BDF101018)**

Submitted to:

The Beat Drugs Fund Association, Narcotics Division, Security Bureau

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I INTRODUCTION

(1) Drug use among adolescents

Adolescent substance abuse is a major global health issue. In China, lifetime prevalence of marijuana use was 1.7% among 12-19 years old students in Guangzhou (Wang, Deng, Wang, Wang, & Xu, 2009), and prevalence of illicit drug use in the last year was 6.4% among 16-18 years old students in Taiwan (Yang, Yang, Liu, & Ko, 1998). In Hong Kong, recent reports have demonstrated that the prevalence of ever use of substances among secondary school student was 2.2% in 2011/12 (Narcotics Division, 2012). In the 2008/09 Action Committee Against Narcotics (ACAN) Student Survey, substance users were found in almost all of the sampled secondary schools in Hong Kong, with the age at first use of psychoactive substances getting much younger (Narcotics Division, 2008).

The significant physical and psychological harms caused by substance use are well documented (Kraner, McCoy, Evans, Evans, & Sweeney, 2001). In particular, drug use among adolescents is associated with increased risk for depression and anxiety (Patton et al., 2002), psychosis (Barkus & Murray, 2010), altered bladder function (Mak et al., 2011), impaired neuro-cognitive functioning (Hanson, Medina, Padula, Tapert, & Brown, 2011) and subsequent obesity in young adulthood (Huang, Lanza, & Anglin, 2013).

(2) Primary, secondary and tertiary interventions for drug prevention

Drug use among students is a highly complex social and health problem. It is deeply rooted in various inter-locked problems encountered by students that are related to their family, inter-personal relationship, school performance and individual problems such as negative coping and poor mental health (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Oesterle et al., 2012). Intensive and inter-disciplinary approaches are hence required for effective drug prevention interventions. Integrated screening and prevention packages have found to be effective in curtailing this problem. Efforts are required to design, implement and evaluate such integrated programs innovatively.

According to public health perspectives, prevention can be primary, secondary or tertiary in nature (Lewis, Sheringham, Kalim, & Crayford, 1988). Drug prevention interventions of all three types are required. Such understanding is an important one. Primary prevention aims at preventing or delaying onset of disease among those who do not currently have the health problem. Secondary prevention aims at early disease detection and targets those showing high risk of having the health problem, whilst tertiary prevention assists those found to have the health problem to prevent further deterioration (Lewis, et al., 1988). In the absence of screening, a primary prevention program (e.g. an essay contest) would be able to target all students in general instead of focusing on high risk students. A simple primary intervention program as such is often unable to change deeper cognitions and/or behaviors of high risk students, as the contents may be overly general. In contrast, only positively screened (high risk) students would be invited to join secondary intervention programs, which are more specific and intensive. During the course of secondary intervention, health workers may also be able to identify hidden substance users and provide them with tertiary services. Such tailor-made secondary intervention programs may hence be more effective in helping high risk individuals.

Secondary intervention programs for drug use prevention have been proven effective in various countries, including those conducted in the United States, Canada, and the United Kingdom (Botvin, Epstein, Baker, Diaz, & Ifill-Williams, 1997; Elliott, Orr, Watson, & Jackson, 2005).

(3) Strong demand for integrated screening and intervention packages

It is apparent that most of the local drug use prevention programs incline toward primary intervention in nature. To our knowledge, there is a dearth of evidence-based and well evaluated local secondary interventions targeting high risk individuals. The urine screening scheme is largely tertiary in nature, as it attempts to provide help to secondary school students who are identified drug users.

The lack of local secondary intervention can partially be attributed to the absence of a locally validated screening instrument for identification of high risk students, which is a prerequisite for implementing secondary interventions. A number of drug screening instruments have been developed in various countries to identify substance users and/or those who are at risk of substance use. Examples include the well-known CRAFFT, DUSI (Drug Use Screening Inventory), and DAST-A (Drug Abuse Screening Test for Adolescents) (The Addiction Research Institute, 2010). However, there is still a need to develop tailor-made screening tools for specific adolescent age-groups of different cultures.

Effective screening and intervention package programs have also been reported. Previous studies have shown that immediate follow-up intervention programs targeting positively screened individual was able to curb adolescent substance abuse efficiently (Elliott, et al., 2005). However, most of these programs had been conducted in the primary care or school-based setting. Examples included the Project STAR and the Project ALERT, the DARE program, the Too Good for Drugs Plan, and the University of Southern California's Project Towards No Drug Abuse (TND) plan (Winters, Fawkes, Fahnhorst, Botzet, & August, 2007). For instance, the TND project targeted high-risk youths who were transferred out of the regular system due to function problems. It consisted of nine intervention sessions focusing on health motivation, social skills, and decision making related to the use of cigarettes, alcohol, marijuana, and hard drug use, and was able to reduce prevalence hard drug use (Sussman, 1996). It is hence greatly warranted to develop secondary drug prevention intervention for local students.

Effective intervention programs should include a number of elements: consideration of both risk and protective factors, sufficient exposure to preventive activities, theory-driven strategies, positive relationship between mentors and mentees, appropriate timing, social-cultural relevance, proper systematic outcome evaluation, and well-trained staffs (Nation et al., 2003). It will be seen from the Program Development section of this report that these elements had all been used in designing our Path-finding Project (PAP), which screened secondary school students at high risk of drug use, and provided them with an intensive, theory-based, evidence-based, positive framed and non-labeling secondary intervention program. The program not only dealt with attitudes related to drug use, but also attempted to deal with the root of the problem by building up protective factors such as family support, self-esteem, life goals and aspirations.

(4) Public health concepts about screening results

As mentioned, an effective screening-intervention package requires a good screening tool. Performance of screening tools can be assessed by epidemiological indicators such as sensitivity and specificity (range from 0-100%). Sensitivity is defined as the percentage of positively screened individuals among all individuals possessing the outcome for detection (e.g. substance use or intention to use substance). Specificity is defined as the percentage of negatively screened individual among all individuals who do not possess the outcome. For instance, 100 students of a school are substance users or intend to use drugs (with the screening outcome), and a screening tool that has a sensitivity of 80% imply that 80 of such 100 students would be screened positive. If the school has 1,000 students who are neither substance users nor intend to use substances (without the screening outcome) and 900 of them were screened negative by the screening tool, the specificity of the screening tool is 90%. It is hence seen that those screened positive may not actually be substance users or intend to use substances, as they might be false positive cases, and as the test is screening but not diagnostic in nature. Those screened positive should not be seen as confirmed substance users, but should be regarded as at higher risk of substance use and demonstrate a stronger need for receiving secondary interventions.

(5) Development of a screening tool to identify students at risk of psychoactive substance use

A screening tool, the Secondary Prevention Screening Index (SPSI) was developed by the research team of the PAP. It was based on the risk factors associated with substance use and intention to use substances among secondary schools that were identified in the 2000/01 ACAN student survey (n=95,788). That survey was commissioned to the Chinese University of Hong Kong and was led by the PI of the PAP (Professor Joseph Lau). In that study, logistic regression models were fit to predict students' psychoactive substance use experience or intention (including current use, ever use and behavioral intention) (Narcotics Division, 2000). A total of 28 significant predictors of psychoactive substance use were subsequently identified. Such variables included those related to smoking, alcohol use, perceptions and attitudes related to substance use, living arrangement with parents, but no question directly asking about the screening outcome (i.e., substance use or intention for substance use). The variables were used to build up a preliminary screening tool, which consisted of an equation that allows for calculation of a screening (risk) score for all individual secondary school students. A cut-off point was determined to classify students' risk level. Students were screened positive if their risk score exceeded the cut-off point, and they were considered at high risk of having an experience of psychoactive substance use in the past or an intention to use psychoactive substances in the future.

In the present study, a revised screening tool (the SPSI) was derived, using data obtained from a survey involving 10 secondary schools in the Shatin and Tai Po districts. It was based on the original 28 significant variables found in the 2000/01 survey but additional variables such as academic aspirations and perceived benefits of psychoactive substances were considered. A cut-off point and its associated sensitivity and specificity were derived. In another case-control study which was part of this project, the tool was further

validated by showing its ability to distinguish between known psychoactive substance users and non-users. Details of its development and evaluation are described further in another part of this report.

(6) PAP as a non-labeling secondary intervention program

In screening-intervention programs, it is important to avoid labeling effect for positively screened students. Stigma was minimized as the screening instrument used in study focused on assessing risk factors of substance abuse, rather than asking the students directly whether they are substance users or not. The subsequent secondary intervention of the PAP was framed positively and was positioned affirmatively as a program aiming at 'finding one's own vocational career and life path'. Throughout its implementation, it was not described as one of drug preventions, neither the Beat Drug Fund was mentioned. Therefore, labeling effect was minimized.

(7) Objectives

The study has the following objectives:

- i. To develop a validated screening tool, the Secondary Prevention Screening Index (SPSI), based on the ACAN 2001 secondary school survey data and refined by using additional variables and new data obtained from ten secondary schools. It can be used to screen secondary school students who are at high risk of psychoactive substance use.
- ii. To test further performance of the screening instrument in predicting current use of psychoactive substance among adolescents.
- iii. To develop a non-labeling, evidence-based and theory-based pilot secondary intervention scheme and to test its feasibility and efficacy when being applied to positively screened secondary school students and students recommended by teachers to join the intensive secondary intervention.

II RESEARCH METHODOLOGIES

(1) Development and validation of the SPSI for identification of secondary school students who are at risk of substance use

(a) Selection of variables for inclusion

In the present study, the screening tool (SPSI) was developed and validated for screening secondary school students who are at high risk of substance use (the screening outcome was ever use of psychoactive substance or intention to use psychoactive substance in the next 12 months). As mentioned, the 28 variables obtained from the ACAN 2000/01 study formed the basis for constructing the SPSI (see Appendix I). In addition, 11 new variables were considered, based on a detailed literature review and discussion among a panel consisting of public health professionals, social workers, and psychologists. These additional factors included family-related factors (e.g. family conflict), school-related factors (e.g. academic aspirations), cognitive factors (e.g. perceived benefits of psychoactive substance use), and psychological factors (e.g. depression). A list of the 28 plus 11 factors considered is shown in Appendix II and details of the measures are listed in Appendix III.

(b) Survey to construct the screening model and determination of the cut-off point

During April to June, 2012, a survey was conducted in 10 secondary schools in Shatin, Tai Wai, Fan Ling, Yuen Long, Tin Shui Wai and Tung Chung. All Secondary 1 to 5 students of the selected schools were invited to participate in that study. An opt-out parental consent procedure was used. Students self-administered the questionnaire in a classroom or school-hall setting, in the absence of teachers. On-site assistance was provided by our fieldworkers. The questionnaire required about 30 minutes to complete. A total of 7,456 students completed the survey. The overall response rate was 98.8%.

(c) Statistical methods to develop SPSI

As mentioned, the screening outcome was students' psychoactive substance use experience and/or intention (i.e. being an ever user of psychoactive substances or possession of behavioral intention to use psychoactive substances in the next 12 months). Variables that were significantly predictive of the outcome were identified by fitting a logistic regression model. A risk score (i.e. probability for having the outcome) was derived for each student, using the following logistic regression equation:

$$Pr(\text{student having the screening outcome}) = 1/(1 + \exp(-(\alpha + \beta_1x_1 + \beta_2x_2 + \dots + \beta_nx_n)))$$

where α is a constant and $\log_e(\beta_r)$ is the odds ratio of predictor x_r .

The probability was used as a score to indicate the level of risk for having the screening outcome. A cut-off point was chosen by considering its associated sensitivity and specificity. Students obtaining a risk score that was higher than the

cut-off point was considered as being positively screened, and vice versa for those obtaining a score that was lower than the cut-off point.

Two logistic regression models were then fit. The first one was based on the 28 significant variables of the 2000/01 ACAN student survey. The second one further considered the 11 additional factors aforementioned. The latter was used to build up the SPSI. Those additional variables that were found to be significantly associated with the prediction/screening outcome (i.e. substance use or intention to use substance in the future) in the univariate analysis were subjected to a backward stepwise background logistic regression analysis, with the 28 variables of the 2000/01 study fixedly entered into the model. To inspect whether a subset of the 11 additional variables would improve the screening performance of the preliminary screening tool that contained only the 28 original variables of the ACAN 2000/01 survey, the -2LL statistics, sensitivity, specificity, and receiver operating characteristic (ROC) curves of the two sets of models were compared. Details of the statistical procedures for constructing the SPSI are documented in Appendix IV.

(d) A case-control study used for validation of the newly constructed SPSI

A separate case-control study design was conducted among 50 adolescents who were known psychoactive substance users (the case group) and 50 adolescents who were non-psychoactive substance users (the control group). Inclusion criteria for psychoactive substance users were: 1) self-reported having used psychoactive substances in the past 12 months. During April to August 2013, participants of the case group were identified by social workers of the YMCA Shatin Youth Outreaching Social Work Team and the Cross Centre of Tung Wah Group of Hospitals. During May to September 2013, participants of the control group were identified by school social workers of four secondary schools. All participants were invited to meet with social workers and to fill out the questionnaire either at the NGO or at the school at a time convenient to them. They self-administered the SPSI questions and were classified as positively or negatively screened according to their risk score with respect to the pre-determined cut-off point of the SPSI. Respective sensitivity and specificity and accuracy of the SPSI were hence determined (see Section IV).

(2) Screening at risk students using the SPSI

A total of seven secondary schools in the Shatin and Tai Po district were invited to participate in the present study (four schools joined the intervention group and three schools joined the control group). A screening survey was conducted from September 2013 to October 2013. Students self-administered the questionnaire in a classroom or school-hall setting in the absence of the teachers. On-site assistance was provided by CUHK interviewers. Positively screened students and some students recommended by teachers to join the study based on perceived needs of these students were invited to join the PAP activities.

(3) Quantitative evaluation of the intervention program

(a) Baseline and follow-up surveys

A baseline survey was conducted from October 2013 to November 2013 (T0). All participants of the intervention group of the four schools were invited to take part in the baseline survey (n=154). For the students of control group, all secondary 2-3 students were invited to take part in the survey, while only the data of those positively screened by using SPSI (n=124) were included as a control group in subsequent analyses in comparisons with the intervention group.

Two follow-up surveys were conducted at completion of the intervention (post-intervention) from September 2013 to October 2013 (T1), and at three months after the intervention, i.e., from December 2013 to January 2014 (T2). At these two time points, 129 students (83.8%) and 127 students (82.5%) of the intervention group, and 85 students (68.5%) and 78 students (62.9%) of the control group, completed the survey at T1 and T2, respectively

Students self-administered the questionnaire in a classroom or school-hall setting in the absence of the teachers.

(b) Evaluation outcome measures

A number of variables were selected from four domains (cognitions, personal growth, personal aspiration and family function) to evaluate outcomes of the PAP intervention. The variables and corresponding measures are summarized below in Chart 1 while details are presented in Appendix V.

Chart 1. Outcome variables of the PAP intervention.

Domain	Construct/variable	Measure and source	No. of items
Cognitive outcomes on substance use	Subjective norm for using psychoactive drugs	• Scale from McMillan & Conner(McMillan & Conner, 2003)	6
	Subjective norm for not using psychoactive drugs	• Self-constructed items for subjective norm*	6
	Perceived behavioral control	• Norman & Conner Scale (Norman & Conner, 2006)	6
		• Self-constructed items for perceived behavioral control*	10
	Negative attitudes toward psychoactive drugs	• Attitude toward the Substance Abuse subscale of the Beliefs and Attitudes of Substance Abuse Inventory (Fok & Tsang, 2005)	6
		• Self-constructed items for negative attitudes towards drug use*	12
Drug avoidance self-efficacy	• Drug Avoidance Self-efficacy Scale (Martin, Wilkinson, & Poulos, 1995)	16	
Personal growth outcomes	Self-esteem	• Rosenberg Self-esteem Scale (Martin, et al., 1995)	10
	Self-efficacy	• Generalized Self-efficacy Scale (Schwarzer & Jerusalem, 1995)	10
	Self control	• Self Control Scale (Grasmick, Tittle, Bursik, & Arneklev, 1993)	16
	Life goals	• Meaning in Life Questionnaire (Steger, Frazier, Oishi, & Kaler, 2006)	5
	Resilience	• Connor-Davidson Resilience Scale (Connor & Davidson, 2003).	25
	Responsibility	• Weinberger Adjustment Inventory – Responsibility(Weinberger & Schwartz, 1990)	8
Outcomes on aspirations	Academic aspiration	• Academic Emotions Questionnaire (Pekrun, Goetz, Titz, & Perry, 2002)	7
	Career aspiration	• Future Work Self (Strauss, Griffin, & Parker, 2012)	5
Family functioning	Family function	• Family Satisfaction Scale (Olson & Wilson, 1989)	10

*Those with * were only measured only at the post-evaluation (T1) and the three-month follow up (T2); the other variables were measured at T0, T1 and T2*

(c) Analysis

The intention-to-treat analysis was employed by this study. The differences in background characteristics of the participants of both groups were tested by chi-square test. The differences in baseline background characteristics and studied variables between the drop-outs and non-drop-outs (defined by those whose baseline data could not be matched with the follow up data) in both groups were tested by independent sample t-tests. The within group differences for the two groups were tested by pair-sample t-tests. The between group differences at baseline (T0) were examined by independent sample t-tests. Between-group differences at post-intervention (T1) and three-month follow-up (T2) were examined using Analyses of Covariance (ANCOVA), adjusting for significant baseline variables with $p < .10$, or using independent sample t-test if no significant baseline variables were observed. Analyses were performed using SPSS version 18.

(4) Subjective evaluation of PAP components

Such evaluation was conducted among students of the intervention group, mentors and parents to evaluate their perceived outcomes of the overall program or specific activities of the PAP. Five brief evaluation questionnaires were completed by students; two were completed by mentors; one was completed by students' parents. Details about these evaluations were summarised in Appendix VI to VIII.

(5) Qualitative evaluation of outcomes

(a) Qualitative evaluation targeting various groups

Different approaches were used to collect qualitative evaluative data from students, parents, mentors and teachers. Sixteen students, four from each of the four schools, were in-depth interviewed at their schools or at the researchers' office (about 45 minutes each). In addition, six parents (from four schools), nine mentors and four teachers (from four schools) participated in three focus group discussion sessions held at the Chinese University of Hong Kong. Semi-structure interview guidelines were used. Topics covered those related to their experiences with the PAP comments with respect to the PAP, and perceived changes among students after participation in the PAP.

(b) Reflections collected during particular activities

In addition, students of the intervention group were asked to perform some expressive writings for reflection, discussion and group debriefing in two occasions of the PAP, which included: 1) recording their feelings in a log book during the intensive training camp held at the Fire Services training school, 2) filling out a worksheet to express their feelings about termination of the program during the last mentorship event. Samples of such materials are included in Appendix IX and X.

(6) Ethics considerations

Ethics approval was obtained from the Survey and Behavioral Ethics Committee of the Chinese University of Hong Kong. For all surveys, an opt-out parental consent process was conducted and informed consent was obtained from students before they filled out questionnaires. Verbal informed consent was obtained before in-depth interviews or focus groups were administered. Participants were informed that their participation was voluntary. All participants of the quantitative and qualitative studies were assured about data confidentiality and that the information obtained from the participants would not be disclosed to a third party, and will only be used for research purpose. No incentive was provided to the participants.

III PROGRAM DEVELOPMENT

(1) Social marketing approach used to design the program

The social marketing approach (Lee & Kotler, 2011) was employed to develop the PAP. The approach has been applied successfully to disseminate evidence-based intervention programs for addiction (e.g. Martin, Herie, Turner, & Cunningham, 1998) and in many youth smoking and substance use programs (e.g. Stead, Gordon, Angus, & McDermott, 2007).

The approach reminds us that it is important to involve stakeholders. Therefore, students, parents, teachers, youth and social workers, health and clinical psychologists, public health workers, fire services personnel, vocational and tertiary educators, and colleagues from NGOs working on substance use prevention, parenting, and mentorship were involved to develop and to fine tune the contents of the PAP throughout the project. Furthermore, a social marketing program always puts the target audience in the centre. We found out that adolescents prefer to listen to people they admire. The Fire Services Department has received the Gold Prize of the Best Public Image Award for seven years. Fire service personnel are greatly admired by many students and parents for their altruism, courage, discipline and resilience. Mentorship provided by fire services colleagues hence became a core component of the PAP.

Scoping is an important part of social marketing. Thorough need assessments were conducted intensively to support program development. A literature review was conducted. Information derived from the screening survey was analyzed, and discussion with students, parents, teachers and social worker was made. Adjustments were made throughout the program upon feedbacks obtained from the students. Positioning is also an important part of social marketing. The PAP positioned itself as one leading students to start thinking about wide and positive opportunities in life, by walking through an important part of their life with them through various mentorship activities. The PAP was hence promoted as an affirmative project motivating adolescents to explore future directions, to develop senses of competence and responsibility, and to create supportive environments for students.

Social marketing considers product, price, place, promotion (Lee & Kotler, 2011). One of the highlights of the products (activities) of the PAP was the intensive training camp taking place at the Fire Services Training School. The place (setting) created an influential and powerful environment fostering discipline, tolerance, team spirit, courage and responsibility. The program was promoted as an adventure-based program rather than a drug-related prevention program in order to reduce labeling effect. It was hence positively framed. With consent, names such as the Beat Drugs Fund were not mentioned throughout the program.

(2) Application of behavioral theories to program design

It is suggested that drug preventive interventions that are based on behavioral health theories are more likely than those non-theory-based programs to be effective (Dusenbury & Falco, 1995). Behavioral health theories have been widely used to

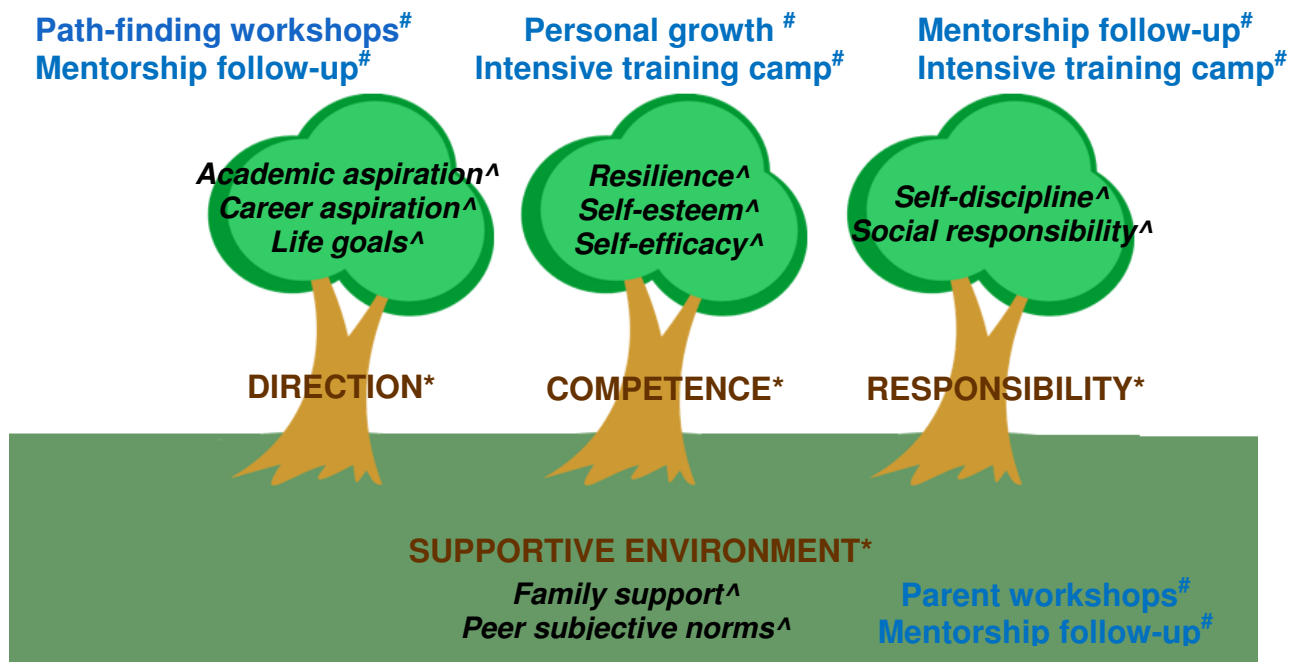
understand problems related to adolescent substance use (Petraitis, Flay, & Miller, 1995). The Social Cognitive Theory was used to (SCT). It has been widely used to modify risk behaviors, including drug use habits (Dusenbury & Falco, 1995). The theory states that there is a dynamic interactive relationship (reciprocal determinism) among behaviors, personal factors and the environment. Individuals model after others' behaviors through observational learning. The PAP hence attempted to improve the family and school environments of the at-risk students, and exposed them to mentorship (role models) in order to induce positive observational learning. The SCT also emphasizes on constructs of behavioral capacity, self-efficacy, outcome expectation and reinforcement. Students were hence trained (e.g. the fire services training camp) and empowered to recognize their potential and capacity, that they could complete difficult tasks if they do not give up. They were also provided with constant encouragements and reinforcement.

Besides, the Theory of Planned Behaviors (TPB) prescribed that attitudes (positive and negative ones) toward substance use, subjective norm (how significant others think about their use of non-use of substance), perceived behavioral control (the degree of control over refusing to use substance) and behavioral intention (whether thinking about trying to use substance) are strong determinants of substance use (Armitage, Conner, Loach, & Wil, 1999; Marcoux & Shope, 1997; Mcmillan & Conner, 2003). A systematic review showed that interventions based on the TPB is helpful in modifying a range of health behaviors, including addictive behaviors (Hardeman et al., 2002). We discussed about anti-drug attitudes and promoted perceived control to avoid drug use in some special sections of the PAP, as well as integrating such anti-drug themes with contents of various adventure activities, so that the program would not be seen by the adolescent participants as lecturing. To foster favorable subjective norm, participants were encouraged to bring along their close friends to join some of the PAP activities, so that such peers could also be positively influenced to establish supportive subjective norm.

(3) The conceptual framework of the PAP

The conceptual framework of the PAP is illustrated in Chart 2. The PAP attempted to prevent substance use by enhancement of four domains of protective factors: 1) identification of future directions, 2) development of sense of competence, 3) development of sense of self-discipline and responsibility, and 4) creation of supportive environment. A set of specific aims was developed under each of these four domains. For instance, there are three aims under the "direction" domain (see Chart 2), including enhancements in life goals, academic aspiration and career aspirations. Evaluation outcomes were then derived for each of these aims. For instance, academic aspiration was assessed by the 7-item Hope subscale of the Academic Emotions Questionnaire (for details of evaluation please, see the section on outcome measures). Furthermore, the aims were achieved by a series of specific events/activities. For instance, the path finding workshops emphasized on exploration of life goals, academic aspiration and career aspiration (see Chart 2). The different types of events/activities are also described in the later part of the report.

Chart 2. Domains, aims and core events of PAP.



* refers to domains;

[^] refers to aims;

[#] refers to core event types

(4) Program development

The contents of the activities were designed by a panel, with members including public health researchers, psychologists, social workers and fire services training officers, and based on literature review and the conceptual framework (see Chart 2) and findings of the needs assessment exercise. The PAP was strongly endorsed by the school principals and meetings were held with the school teachers to gain their support. It was publicized in the four intervention schools.

(5) Pre-induction activities

A briefing was held in the school assembly, involving all Secondary 2-3 students. The briefing highlighted the attractive modalities of the PAP to the students, including the intensive training camp held at the Fire Services Training School, adventure-based activities and mentorship provided by fire services personnel. The effort removed stigma and positioned the PAP positively. The project was well received by the students, teachers and parents.

(6) Major events and specific activities.

The PAP has five major types of events (see Chart 2), under each of which a number of specific activities were held. The activities aligned with the specific aims of the four domains to be achieved by the project (Chart 3). For instance, path-finding workshops activities tried to promote the aims of enhancing life goals, academic and career aspirations of students (Chart 3). The details of the activities are summarized in Chart 4 and the flow of implementation of these activities is summarized in Chart 5.

Chart 3. Conceptual framework, intervention events and activities of the PAP.

Core types of event:		Personal growth groups				Path-finding workshop	Parent workshops	Intensive training camp	Mentorship follow-up	
Activities of core types of event:		Induction camp	Student team building day	School-based personal growth workshops	Definitional ceremonies	Path-finding workshops	Parent workshops	Intensive training camp	Mentor trainings	Mentorship follow-up
Domain	Direction									
Aim	<i>Academic aspiration</i>					*				*
	<i>Career aspiration</i>					*				*
	<i>Life goals</i>					*				*
Domain	Competence									
Aim	<i>Self-esteem</i>	*	*	*	*			*		
	<i>Self-efficacy</i>	*	*	*	*			*		
	<i>Resilience</i>		*					*		
Domain	Responsibility									
Aim	<i>Self-discipline</i>							*		*
	<i>Social responsibility</i>							*		*
Domain	Supportive environment									
Aim	<i>Family support</i>				*		*			
	<i>Peer subjective norm</i>	*		*	*				*	*

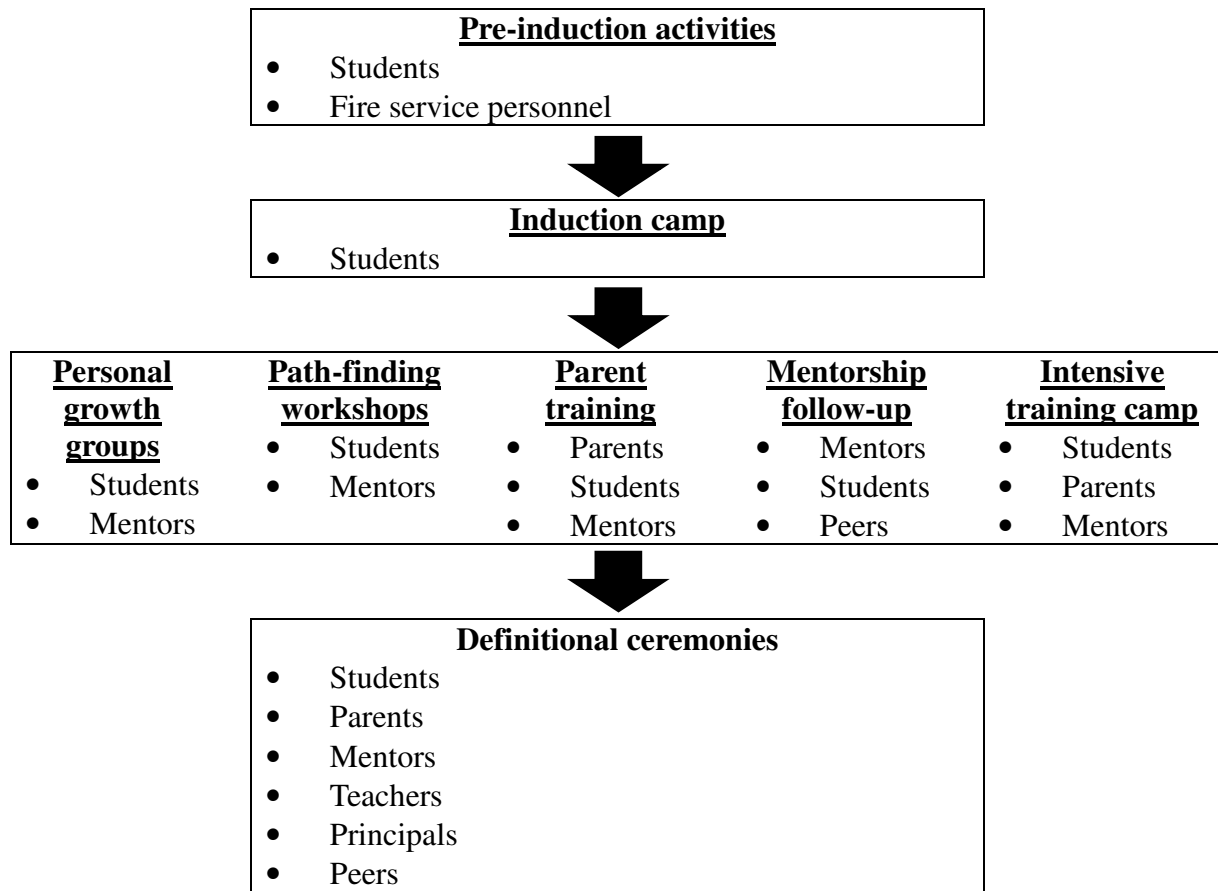
Chart 4. Description of specific intervention activities of the four types of events.

Type of event	Activity	Aim to be achieved	Description
Personal growth workshops	Induction camps	<ul style="list-style-type: none"> • Self-efficacy • Peer subjective norm 	<ul style="list-style-type: none"> • Included an induction day and an induction visit • The induction day included: <ul style="list-style-type: none"> ▪ One-day team building program: To build rapport among students and promote students' commitment to the year round program ▪ The half-day induction visit to the Fire Services Training School: To promote students' self-efficacy and positive attitude to the intensive training camp.
	Student team building day	<ul style="list-style-type: none"> • Self-esteem • Self-efficacy • Peer subjective norm 	<ul style="list-style-type: none"> • One-day team adventure program: <ul style="list-style-type: none"> ▪ To build rapport between mentors and mentee, and ▪ To promote self-esteem and self-efficacy, in order to prepare participants for the year round program.
	Personal growth workshops	<ul style="list-style-type: none"> • Self-esteem • Self-efficacy • Resilience 	<ul style="list-style-type: none"> • Seven sessions of school-based cognitive behavioral group: <ul style="list-style-type: none"> ▪ To promote self-esteem, self-efficacy and resilience by modifying high-risk cognitions and behaviors, and ▪ To develop anti-drug skills to prevent drug use among students
	Definitional ceremonies	<ul style="list-style-type: none"> • Self-esteem • Self-efficacy • Family support • Peer subjective norm 	<ul style="list-style-type: none"> • Facebook activity, graduation ceremony of camp and closing ceremony of the Project that involved family members, peers, teachers, principals and mentors: <ul style="list-style-type: none"> ▪ To acknowledge students' talents and achievements, and ▪ To translate students' positive changes in program to daily life, through witnessing stories told by participants and outsiders

Type of event	Activity	Aim to be achieved	Description
Path-finding workshops	Path-finding workshops	<ul style="list-style-type: none"> • Academic aspiration • Career aspiration • Life goal 	<ul style="list-style-type: none"> • Four sessions of path-finding workshop: <ul style="list-style-type: none"> ▪ To motivate student to find their own paths through self-understanding, exploration on the diversity of study and career paths, exploration on work life and reflection
Parent workshops	Parent workshops	<ul style="list-style-type: none"> • Family support 	<ul style="list-style-type: none"> • Two training workshops and one parent-child-mentor activities: <ul style="list-style-type: none"> ▪ To promote positive parent-child relationship with developmentally appropriate and effective parenting skills
Intensive training camp	Intensive training camp	<ul style="list-style-type: none"> • Self-esteem • Self-efficacy • Resilience • Self-discipline • Social responsibility 	<ul style="list-style-type: none"> • Four-day camp held at the Fire Services Training School that emphasize multi-intelligence, teamwork, toughness, and problem-solving: <ul style="list-style-type: none"> ▪ Fire Services recuing training to nurture self-efficacy, resilience and social responsibility ▪ Disciplinary training to nurture self-discipline and social responsibility. ▪ Observational training of fire services trainee at the training school and the visiting mentors to model the fire services spirit ▪ Debriefing to consolidate daily experience and reflection with mentors, social workers/psychologists and/or teachers. • Parent and mentors attend graduation ceremony to recognize and reinforce their achievements.

Type of event	Activity	Aim to be achieved	Description
Mentorship follow-up	Mentor training	<ul style="list-style-type: none"> • Peer subjective norm 	<ul style="list-style-type: none"> • Three sessions of mentor training workshop: <ul style="list-style-type: none"> ▪ To understand youth development and issues, and to acquire effective mentoring skills to adolescents who are at-risk for substance-use, and ▪ To understand PAP conceptual framework
	Mentorship program	<ul style="list-style-type: none"> • Life goal • Academic aspiration • Career aspiration • Self-discipline • Social responsibility • Peer subjective norm 	<ul style="list-style-type: none"> • Five sessions of mentorship program: <ul style="list-style-type: none"> ▪ To promote observational learning to fire-fighters as role models and established the anti-drug subjective norm • Fire services mentors and students participated in other PAP activities (e.g. path-findings workshops, personal growth group and briefing sessions of intensive training camp): <ul style="list-style-type: none"> ▪ To assist students to integrate their experiences obtained and to find directions.

Chart 5. Flow of the intervention activities.



IV RESULTS ON DEVELOPMENT OF THE SCREENING TOOL

(1) Development and validation of SPSI among secondary school students

(a) Variables to be used for building up the screening instrument (SPSI)

All the original 28 variables of the original SPSI developed in the 2000/01 study were significantly associated with the screening outcome (i.e., current use of psychoactive substance, ever use of psychoactive substance or intention to use psychoactive substance in the coming year). In the univariate analysis, the 11 new factors considered in this study were all found to be significantly associated with the aforementioned screening outcome. Two of these 11 variables (perceived benefits of psychoactive substances and academic aspiration) remained statistically significant in the backward stepwise analysis. The revised SPSI have hence added these two variables to the 28-item original screening tool. Details about the variables used in this model and their corresponding odds ratios are listed in Table 1.

(b) Cut-off point and performance of the SPSI

The logistic regression results suggested a cut-off point of 0.017 to be used for screening. Participants with SPSI score exceeding the cut-off point were considered as positively screened (at-risk). The proportion of secondary students positively screened was 15.9%, while the specificity and sensitivity were 85.1% (95% confidence interval = 84.0%, 86.2%) and 75.0% (95% confidence interval = 73.6% , 76.4%), respectively. The comparison of the areas under the respective ROC curves (area = .88 versus .85) of the original and revised SPSI showed that the revised one performed significantly better than the preliminary one that was developed in 2000/01 study ($p < .01$) (Figure 1).

(c) Validity of the SPSI in predicting current psychoactive substance use

The revised SPSI was applied further to distinguish a group of 50 current adolescent psychoactive substance users from a group of 50 non-users. There were no between-group differences in gender, age and education level. The characteristics of these two groups were presented in Table 2. The performance is satisfactory as the sensitivity, specificity, and accuracy were high: 93.8%, 85.4%, and 89.6% respectively.

	Non substance users	Known substance users	All
SPSI – Negative	41	3	44
SPSI – Positive	7	45	52
All	48	48	96

(2) Implementation of screening and secondary intervention activities

The screening survey was conducted from September 2013 to October 2013. A total of 1,728 secondary 2-3 students from the seven participating schools were invited to take

part in the survey; 1,692 students completed the survey (participation rate = 97.9%). A total of 124 and 188 students of the control group and the intervention group were screened positive by using the SPSI, respectively. The prevalence of positive screening was 24.5% (124/507) and 15.8% (188/1,185), in the control and intervention groups, respectively. A total of 154 students participated in the secondary intervention program of the PAP. These included SPSI positively screened students plus some students recommended by teachers whom were seen by teachers to have special needs and would benefit from the program.

On average, 109 students (71%) participated in each of the 21 sessions of various activities; 52 parents (34%) participated in each of the three sessions of the parent workshops. A total of 137 mentors were trained, and 36 of them participated in the six sessions of activities requiring mentorship. In addition, 70 peers of the students participated in some of the intervention sessions. The number and type of participants in the 10 activities of the PAP is listed in Chart 6.

Chart 6. Participation in PAP activities.

Event	Activities	No. of beneficiary for each session
Personal growth groups	Induction Day	134 students
	Induction Visit	146 students
	Student team building day	129 students
	School-based personal growth group (7 sessions)	106 students
	Definitional ceremonies (2 sessions)	103 students 32 family members 47 mentors 40 peers 10 teachers and guests
Path-finding workshops	Path-finding Workshops (4 workshops)	98 students
Parent workshops	Parent Workshops (3 sessions)	52 parents
Intensive Training Camp	Fire Services Intensive Training Camp	137 students
Mentorship follow up	Mentor Training Workshops (3 sessions)	137 mentors
	Mentorship Program (5 sessions)	34 mentors 101 students 30 peers

V RESULTS OF QUANTITATIVE EVALUATION

(1) Participants' characteristics measured at baseline

The baseline analysis included 278 participants (154 from the intervention group and 124 from the control group); More than two-third of the participants (70.1% of the intervention group and 68.5% of the control group) were male and more than one-third (40.0% for intervention group and 37.9% for the control group) were living in private housing units (Table 3).

At baseline, there were no significant differences in background characteristics between the two groups (Table 3). Comparison of other studied variables showed some significant baseline differences observed between the intervention and control groups ($p < .05$): 1) subjective norm for using psychoactive substance, 2) life goal, 3) responsibility, and 4) career aspiration. In addition, two variables showed p value between .05 and .10 (family function and academic aspiration) (Table 4). These variables were adjusted for by Analysis of Covariance (ANCOVA) when comparing between-group differences (intervention versus control) at post-intervention time (T1) and the three-month follow up (T2).

The follow-up rates (defined as: 1- percentage of students whose baseline data could not be matched with the follow-up data) for the control group and the intervention group were 68.5% and 80.6% at T1, and 62.9%, and 79.4% at T2, respectively. When comparing those followed up versus those not being followed up, there were no significant differences in most of the variables considered in this study. A few exceptions were 1) living in private estate (T1) among intervention group, 2) self-efficacy in avoiding drugs (T2) among intervention group, and 3) level of responsibility (T1 and T2) among intervention group. The results are shown in Tables 5 to 6.

(2) Between-group comparisons at post-intervention (T1) and at the three-month follow-up (T2)

At T1 (post-intervention), significant between-group differences (intervention versus control) were found in most of the drug-related variables and other cognitive variables ($p < .05$). Specifically, participants in the intervention group, as compared to the control group, scored:

1) significantly lower scores on *subjective norm on psychoactive substance use* after controlling for baseline score, 2) significantly higher scores on *perceived behavioral control* (Norman and Conner Scale and self-constructed items), 3) higher *drug avoidance self-efficacy*, 4) more *negative attitudes towards psychoactive drugs* (self-constructed items), 5) higher score on *self-esteem*, 6) higher *resilience*, and 7) higher *academic aspiration*. The mean values are presented in Table 7.

Similarly, significant between-group differences were found in eight outcome measures ($p < .05$) at T2 (three-month follow-up). Participants in the intervention group, as compared to the control group, scored significantly higher scores on: 1) *perceived behavioral control* (self-constructed items), 2) *drug avoidance self-efficacy*, 3) *negative attitudes towards psychoactive drugs* (self-constructed items), 4) *self-esteem*, 5)

resilience, 6) *family function* after controlling for baseline scores, 7) *career aspiration* after controlling for baseline scores, and 8) *academic aspiration* after controlling for baseline scores. The mean values were presented in Table 7.

(3) Within-group changes between post-intervention measures and baseline measures (T1 versus T0) and between three-month follow-up measures and baseline measures (T2 versus T0)

In the intervention group, analysis comparing T1 versus T0 showed significant within-group increases (improvements) in eight variables: 1) *perceived behavioral control* (Norman and Conner Scale), 2) *drug avoidance self-efficacy*, and 3) *negative attitudes toward psychoactive drugs* (items of the 2000/01 ACAN study), 4) *self-esteem*, 5) *resilience*, 6) *self-efficacy*, 7) *family function*, and 8) *academic aspiration*. In contrast, no significant within-group changes were observed in the control group (Table 8).

Similar comparisons of T2 versus T0 within the intervention group found significant within-group increases (improvements) in: 1) *perceived behavioral control* (Norman and Conner Scale), 2) *drug avoidance self-efficacy*, 3) *self-esteem*, 4) *resilience*, 5) *self-efficacy*, and 6) *academic aspiration*. Significant within-group changes were only observed in variables of perceived behavioral control (the Norman and Conner Scale) and life goals among participants in the control group (Table 8).

(4) A summary chart of the main findings

The variables giving statistically significant between-group or within-group differences in the evaluation outcomes are summarized in charts 7 to 8 below:

Chart 7. Summary of findings for between-group difference.

Domains	Outcomes for evaluation	Between-group difference at T1	Between-group difference at T2
Cognitive outcomes on substance use	• Subjective norm for using psychoactive substances	√	NS
	• Perceived behavioral control for not using psychoactive substances (Norman and Conner Scale)	√	NS
	• Perceived behavioral control for not using psychoactive substances (Self-constructed items)	√	√
	• Drug avoidance self-efficacy	√	√
	• Negative attitudes toward psychoactive drugs (self-constructed study)	√	√
Personal growth outcomes	• Self-esteem	√	√
	• Resilience	√	√
Outcomes on aspirations	• Academic aspiration	√	√
	• Career aspiration	NS	√
Family functioning	• Family function	NS	√

NS: Not significant

Only outcomes with significant differences are shown

Chart 8. Summary of findings for within-group difference.

Domains	Outcomes for evaluation	Within-group difference between T0 and T1		Within-group difference between T0 and T2	
		Intervention group	Control group	Intervention group	Control group
Cognitive outcomes on substance use	• Subjective norm for not using psychoactive drugs	-	-	-	-
	• Perceived behavioral control (Norman and Conner Scale)	√	NS	√	√
	• Perceived behavioral control (Self-constructed items)	-	-	-	-
	• Drug avoidance self-efficacy	√	NS	√	NS
	• Negative attitudes toward psychoactive drugs (from ACAN study)	√	NS	NS	NS
	• Negative attitudes toward psychoactive drugs (self-constructed study)	-	-	-	-
Personal growth outcomes	• Self-esteem	√	NS	√	NS
	• Self-efficacy	√	NS	√	NS
	• Life goals	NS	NS	NS	√
	• Resilience	√	NS	√	NS
Outcomes on aspirations	• Academic aspiration	√	NS	√	NS
Family functioning	• Family function	√	NS	NS	NS

-: Not applicable as no baseline-data was available; NS: Not significant
 Only outcomes with significant differences are shown

(5) Subjective evaluation of outcomes made by students of the intervention group, parents and mentors

(a) Students

The majority of the students found that the core activities (i.e. mentorship program, path-finding workshops, personal growth workshops, intensive training camp) were helpful in increasing their support and improving their personal skills (85.4% to 99%), were satisfied with such activities (100% for mentorship; 81.7% for path-finding workshops; 92.7% for personal growth workshops; 94.8% for the intensive training camp)(Tables 9 to 13), and believed that the PAP has improved their academic aspiration psychosocial health, family relationship, and cognitions about psychoactive substances (89% to 100%). All students reported that they were satisfied with the PAP(Tables 9 to 13).

(b) Parents

Almost all parents agreed that the workshops have increased their understandings on the principles of parenting and their knowledge on how to develop a healthy and intimate relationship with their children (98% to 100%), more understanding on adolescent psychoactive substance use (93% to 100%), ways to discipline their child(ren) (95% to 100%), and ways to deal with their own emotional problems (100%) (Table 14).

(c) Mentors

The majority of the mentors agreed that the mentorship has increased their understanding on different issues relating to adolescent development (e.g. cross-generational relationship, cross-generational poverty and adolescent positive development, psychoactive substance use among adolescents, mental health, and communication with adolescents) (90% to 99%). It has also increased their confidence to become a mentor in the future (91%). Almost all (98%) were satisfied with the mentorship training (Table 15).

Besides, the majority believed that the mentorship experience has helped them in: discovering their new strengths and capabilities, communicating with their family and their colleagues better (68%-96%), and developing a stronger wish to lead positive and meaningful life (98%). All of them were satisfied with the mentorship experience and agreed that similar interventions should be developed in the future (Table 16).

VI RESULTS OF QUALITATIVE EVALUATIONS

(1) In-depth interview and focus groups

Students, parents, mentors and teachers made very positive comments on the overall project and the intervention components during in-depth interviews and focus group discussions. Some citations were presented in Appendix IX.

With respect to the screening tool, teachers in general acknowledged that it was useful in increasing their awareness of students' special needs:

- *“The screening instrument is quite accurate to indicate their (students’) personal and familial issues”.*

(a) Students

Students in general believed that the team building day promoted personal breakthrough, teamwork and mentor support. They were motivated to identify their interest and think about their future, and were able to find possible paths to achieve short-term and long-term goals in the path-finding workshops. The personal growth workshops were able to promote their thinking and resulted in sharing, deepened skills to refuse drug use, and created positive peer influence. Some citations include:

- *“ I was afraid of high events (e.g. high facilities in playground), but was not afraid with mentors’ encouragement on that day...Now, I am brave and am able to play rides”*
- *“Think more in the future. What I want to do was unrealistic in the past. Now, I consider my talents and have more ideas. For instance, we visited an institute in PAP that inspired me to work in salon”*
- *“It seems to me that the “SAY NO” skills are more less the same...However, the learning method in PAP impressed me...we picked some papers...we have thought numbers of interesting and special scenarios...I can remember well...these skills were actually included in the liberal lesson, however, PAP helped me to remember.”*

Some students recalled lots of memorable and inspiring experiences in the intensive training camp. The fire services training was believed to have promoted their toughness, problem solving and self-esteem. The disciplinary training was believed to be able to train them to stick to disciplines, develop politeness and sense of responsibility. The activities promoted teamwork and acceptance to work with peers. The fire services officer training encouraged the students to overcome adversities to create a more meaningful future. Some citations are given:

- *“Just like what we experienced in the dark tunnel...we hit again and again to learn that the road was blocked...when we face challenge, we should not avoid. We should try few times. If we cannot work out the solution, we can ask for help from others...We should not refuse to try the difficult and troublesome tasks. Actually, it can be applied to homework of Mathematics...”*
- *“do my son’s responsibility...do my student’s responsibility...work hard for*

- *academic study now...keep my room tidy...”*
- *“I experienced teamwork in the marching training of the camp. We needed consistent pace...I could do it so as others could do it, and I finally could do it.”*

Some students were also impressed by their positive thinking, toughness and altruism shown by their mentors. They expressed that they have changed their perceptions toward adults after receiving care, support and guidance from the mentors. In addition, the activities helped student to remember and analyze anti-drug messages. Some citations are presented:

- *“Participation of fire services personnel had great impact on me. All fire services mentors think positively. I was used to think negatively, but I became much more positive thinking.”*
- *“Due to mentors, I complain less of adults...I try to listen what adults say and think about their words... I have more patience and less complaint on adults.”*
- *“Compared to school drug test...I forgot what they had discussed...however, in the PAP, we had to analyze after listening...the method for memorization was fun”*

(b) Parents

The parent workshops promoted parental autonomy for students. Parents were impressed by the students’ changes and achievement in the graduation ceremony of the intensive training camp. Parents also highlighted students’ motivation to find future directions, and positive role model and guidance provided by fire services mentors. Samples of the citations included:

- *“The parent-student-mentor workshop impressed me most. In the primary school, parent-child activities were led by parents. I was surprised that our children were active in grouping, task arrangement, planning route. At that moment, I was aware that our children were able to plan without us. Our children led us in the trip, which we had never thought of...it was good experience”*
- *“My son has grown and started to find future direction. After visiting the VTC, he discussed with me to learn cooking if he was not interested to be promoted to higher forms. He is now form 3 and he needs to choose subjects. He is able to consider what he wants to do in the future and hence which subject to choose in form 4. Also, he searches for information in the internet regarding career development, university major courses, and hence subjects selection in the nearer future...I really appreciate it. I believe that PAP motivates them to think about future, and find their paths toward the goal.”*

(c) Mentors

Rapport between mentor and mentee was built in the mentorship follow-up activities. Mentors shared their life experience and walked with adolescents for their developmental issues. Mentors provided support to students in the course of the program. Some of them said:

- *“Truthful sharing...we can discuss and share our experiences. There was one*

student listening to my sharing, and then many of the students...The student also shared their issues, for example, how complex his family background was.”

- *“There was a student who has low in self-confidence...peers voted and forced him to present in front of people...he was able to present and had more confidence...he volunteer to present in the next time...”*

(d) Teachers

Positive peer influence was formed in the peer group and mentorship program. Some teachers perceived that their students have showed positive changes in their academic attitudes, self-confidence, assertiveness, politeness and other aspects. The program was helpful to parents. They stated:

- *“The group has pretty good influence...group members had positive influence on each others”*
- *“Major issues of students were short attention span and low self-confidence...they improved much...they have higher self-confidence, adventurous, assertiveness, politeness...no longer complaining.”*
- *“Parents need similar program...Parents emphasize academic performance, regardless of poor academic performance of students...parents push too harsh on academic performance and induce lots of conflicts, which lead to unwillingness to attend school among students...parents seem to understand something in the program...appropriate autonomy and encouragement”*

(2) Reflective writing collected during activities

The expressive writing of students of the intervention group reflected their changes in the course of activities, appreciation to the mentors and hope for their future. Samples of materials of the first two reflective exercises were included in Appendix X.

Students recorded their impressive daily memory, moods, discovery and appreciation in the log book during the intensive training camp held at the Fire Services training school. Although some of the students expressed negative moods and events in the first two days (e.g. angry, punishment), most of them recorded very meaningful memory (e.g. teamwork), positive moods (e.g. happy), positive discovery (e.g. toughness), and appreciation (e.g. peer role model) when approaching the end of the training camp.

At the last mentorship event, students filled out a worksheet about their thoughts about the termination of the PAP, including feelings, changes throughout the project, words to oneself and words to others. Most of the students expressed positive feelings (e.g. happiness and fruitfulness) and positive changes (e.g. toughness and motivation) in the program, hopeful future (e.g. life becomes better after challenge, academic and career goal), and appreciation to mentors (e.g. their time spent and support given).

VII DISCUSSION

(1) Overview

The PAP, one of the very few secondary interventions for substance use prevention for secondary school students, has successfully developed a screening tool (SPSI) which can be used effectively to identify students at high risk of substance use, and to provide them with comprehensive intervention activities, in collaboration with the Fire Services Department and many stakeholders including schools, parents and community workers.

The results of the PAP have been very encouraging. It improved high risk students' self-esteem, resilience, self-efficacy, academic aspiration, and family function. These are all well known protective factors against adolescent psychoactive substance use and would hence contribute to drug prevention. Besides, the PAP was effective in improving cognitions directly related to substance use, such as increasing self-efficacy to avoid drugs, increasing perceived behavioral control of substances, and formation of negative attitudes toward substance use. The integrated screening-intervention package has therefore fulfilled its aims for detection of high-risk students and providing them with an intensive and effective secondary intervention against psychoactive substance use. Students would also benefit from improvements in the protective factors which have impacts beyond drug prevention and may affect their entire life.

The PAP has important features to guide future programs, such as being evidence-based, theory-based, student-oriented, mentorship-based, non-labeling, having multiple-components and involving stakeholders. The secondary intervention emphasized on protective factors, instead of condemning students' negative thoughts and behaviors. It was built upon the important understanding that students' substance use problem is a manifestation of complex underlying challenges and problems, and the belief that superficial interventions targeting these at risk students are deemed to be ineffective. Also, many believe that such high-risk students are hard to engage, but the PAP showed that such is not true. It is possible for mentors to walk through an important phase of adolescence with the students. We influenced these high risk students through observational learning, via mentorship instead of impersonal lectures and threats. Hence, we tried to deal with the roots of their problems, which are hard but have to be dealt with. The PAP had been very well received by these students, their parents and teachers.

(2) Development and validation of the screening instrument (SPSI)

Firstly, we have developed the SPSI, a screening instrument that can be used to identify Hong Kong secondary school students who are at risk of psychoactive substance use. It showed satisfactory performance in distinguishing between current adolescent psychoactive substance users and non-users (sensitivity: 93.8%; specificity: 85.4%; accuracy: 89.6%). Its development was based on considering the 28 risk factors obtained from the large scale ACAN 2000/01 student study (n=95,788) which did not include direct questions about experience of substance use; students were hence willing to answer those non-labeling questions. In our validation survey (n=7,456), we added two factors about students' perceived benefits of substances and academic aspirations,

making the tool more comprehensive and increased its performance. The wide scope of the variables (e.g. socio-economic factors, living arrangement, attitudes toward substance use, aspirations) used in the prediction equation reminds us about the complexity of the nature of substance use among secondary students, and that we need to take comprehensive, integrated, intensive and innovative approaches, rather than very brief health promotion activities when we target high risk students. It hence calls for secondary intervention.

(3) Potential applications of the SPSI

The development of this tool offers policy makers an alternative for screening secondary students for the purpose of psychoactive substance prevention. As a screening tool, it is by definition not as accurate as urine testing which is diagnostic in nature, but the purposes of the two types are totally different and should not be mixed up. The SPSI screens students at high risk and aims at providing them with secondary intervention. Urine testing however, aims largely at rehabilitation (tertiary intervention). The SPSI has the advantages of having far less labeling effect and possibly better acceptability. It is less costly and involves simpler administration.

Some reminders however, need to be provided on future applications of the SPSI. First, as a screening tool, it should always be used together with a secondary intervention, as it is meant to be part of a screening-intervention package such as the PAP. Second, teachers need to receive minimal training about epidemiology of screening before using the tool. As a screening tool, a positive case means a higher likelihood (risk) of substance use rather than a confirmed case (diagnosis). Therefore, a positively screened student should not be taken as a substance user, but instead, one that has a stronger need to receive secondary intervention. Third, all precautions need to be made on confidentiality and the schools need to discuss who would have accessibility to the screening results. Fourth, all efforts should be made to ensure that it would be a non-labeling exercise. As a reference, about 15% of the students of the four participating intervention schools were screened SPSI positive. Open discussions about implications and potential applications of the SPSI are warranted.

(4) Theory-based and social marketing approaches for designing secondary intervention

As discussed, the PAP was one of the very few secondary interventions for prevention of psychoactive substance use among Hong Kong secondary students. Secondary intervention, unlike primary prevention, needs to be intensive. It also needs to be theory-based. The PAP was based on the Social Cognitive Theory. It reminds us that we have to improve students' environment which determines his/her behavior; we hence involved their families (parental workshops, various ceremonial gatherings) and schools (teachers' involvement and school-based activities). It also reminds us the importance of role models; we hence involved fire-service personnel as mentors. It prescribes that outcome expectancy and self-efficacy are also important determinants of behaviors; we hence tried to guide students to find future directions, and encouragement to instill the sense that they could achieve something if they insist working on it. We also used the Theory of Planned Behavior. Its constructs of attitudes toward substance use and perceived

control (self-efficacy and skills) to avoid substance use were used as themes of some of the PAP events.

The social marketing approach was used to guide the program design. It reminded us that prevention activities need to be student-oriented (rather than health professional-oriented). For instance, some students do not like to be lectured about harms of substance use and how inadequate they are. Instead, they want to be around with people whom they admire, and we found out that fire services mentors fits their wants, for their courage, altruism, physical fitness and more. We are very fortunate to have the full support provided by the Fire Services Department, and we are most thankful to the efforts of all the mentors, who served as volunteers and worked closely with us for a few months, taking personal leaves from time to time. The collaboration makes PAP unique and very attractive to youths. In social marketing, the messenger, in this case their mentors, is as important as the messages. To be student-oriented, PAP took the adventure approach, but mingled it with outbound visits and small group activities.

(5) Program components and contents

The PAP has been developed to foster four key domains of protective factors against psychoactive substance uses: finding a direction in life (e.g. finding life goals, and enhancement of academic and career aspirations), increasing competence (e.g. self-esteem, self-efficacy, resilience), increasing a sense of responsibility (e.g. self-discipline, sense of responsibility), and increasing perceived support (from family, mentors and teachers). Five core types of events (mentorship program, path-finding workshops, personal growth workshops, intensive training camp, parental workshops) which included nine specific activities targeting students and parents, were developed by a panel of interdisciplinary researchers, social workers, youth workers and health professionals. There were a total of 28 sessions of such activities. The PAP program is thus a well-designed, structured, theory-based and evidence-based intervention. It is important to highlight again that the PAP was framed positively as an adventure-based program, in order to reduce labeling effect associated with participation in a program for prevention of psychoactive substance use.

(6) Effective outcome evaluations

The study has the strength of being carefully evaluated by multiple modes of quantitative and qualitative methods. A control group (three schools) was involved as students of the intervention would undergo developmental changes and need to be compared to a control group that had not received PAP intervention. Importantly, the findings consistently show that the PAP had effectively fostered positive changes. With regard to protective factors, the intervention group, as compared to the control group and at post-intervention, attained better self-esteem, resilience and academic aspiration. With regards to cognitions related to substance use, the intervention group also showed more favorable perceptions on perceived control to avoid psychoactive substances, substance avoidance self-efficacy, and negative attitudes towards psychoactive substance use, as compared to the control group. Therefore, PAP has impact both on the protective and risk factors of psychoactive substance use among a group of high risk students. Consistently, similar desired improvements in personal growth and substance-related cognitions over time were

observed within the intervention group when their data measured at Month 3 was compared to those measured at baseline, while there were almost no improvements over time observed in the control group within the study period. Such findings further support the efficacy of the PAP in substance use prevention. Changes in many of the protective factors (e.g. self-esteem, resilience, self-efficacy, academic aspirations) would not only contribute to substance prevention, they may also change the future pathway to be taken by the students and we expect there will be long-term impact on the students.

Importantly, all students reported that they gained better understanding of psychoactive substances, better self-control to avoid substance use, and were more confident that they would not take psychoactive substances in the future. Besides, students of the intervention group subjectively reported that they perceived improvements in their personal skills, sense of competence, perceived level of support, and personal strengths and capabilities. They believed that they had gained understanding of the study or career paths they could take in the future, became more able to set goals and directions, more hopeful about the future, and more able to face difficulties and challenges in the future. They also expressed that they had improved communication and relationship with their family members. The positive impact of PAP onto students was further confirmed by the results of the qualitative evaluation.

Overall, evaluations of the PAP consistently showed improvements in the targeted protective factors of psychoactive substance use.

(7) Participants' warm responses to the PAP activities

By all measures, the program was extremely well received, not only by the students, but also by their teachers, parents and mentors. As a result, the PAP has received extremely positive feedbacks from the students and all stakeholders. There were many touching moments. The majority of the students (81% to 100%), participating parents (100%) and mentors (100%) were highly satisfied with the core activities of PAP. The majority of the mentors supported PAP to be held in the future and was happy to serve as mentors again in future PAP, if it is to be offered again. Positive feedbacks from students, teachers, parents and mentors have been captured in the booklet prepared for the closing ceremony as well as the video clippings which are enclosed with this report.

(8) Benefits to the participating parents and mentors

Findings suggest that the PAP was also beneficial to the participating parents and mentors. Parents felt that they had improved their parenting skills and parent-child communication, gaining understanding about their emotions and substance use problems. Mentors felt that they understand adolescent development and substance use problems better, and were more able to communicate with adolescents.

(9) Limitations

The study has some strengths but also some limitations. The number of schools involved is small. Further implementation research is hence still required. The sample size was also small but since statistical significance was observed in a number of key evaluation

outcomes, it does not face a problem of inadequate statistical power. While the strength was that it carried a control group and used the randomized cluster control design, the participating schools may have different culture and characteristics. Moreover, the three month follow-up period was relatively short. We do not know whether the improvements would fade over time, although we expect some lasting effect would remain as the participants were deeply impressed by the interactions with the mentors and expressed that such was a life experience, one not to be forgotten.

VIII RECOMMENDATIONS

The research team would like to make several concrete recommendations:

1. We strongly recommend continuation and scaling up of the promising PAP in the future, as it was well received by students and has shown to be a unique and effective secondary intervention program. Similar secondary interventions do not seem to exist in Hong Kong. The PAP experience shows that it is feasible to run secondary substance prevention programs within school setting; school principals, mentors and parents taking part in the PAP all welcome and are looking forward to witnessing its continuation. The Fire Services Department has played a pivotal role in the success of the PAP. Their continuous support is the most essential.

It is important and possible to make good use of existing resources to sustain the PAP in the future. It is encouraging to see that in the last few years, the Smart Teens program of the Education Bureau has covered about 26 secondary schools per year. In that program, Secondary 2 to 5 students also join a 4-night camp at the Fire Services Department. However, the camp is one off and no follow-up was provided to the participating students, and no mentorship were involved. There are hence rooms for improving its effectiveness. This existing arrangement offers an excellent opportunity for PAP components (such as SPSI screening, pre-camp induction, parental involvement, mentorship, school-based follow-up workshops and outbound visits) to be integrated with the Smart Teens Program. The team has discussed this possibility of integration with the director of the Fire Services Department, Mr Chor-kam Chan, who has kindly fully endorsed the proposal of having a new project integrating the PAP with Smart Teen programs, starting from September 2014. We have also discussed the opportunity with the Permanent Secretary for Education, Ms Cherry Tse, who has written to us that she supports the integration proposal in principle. The team will hence submit a proposal to the Beat Substance Funds for consideration of funding for this extended PAP.

2. We recommend open discussions to be made among stakeholders on policy of screening high risk students using SPSI developed by this project, including but not limited to how to utilize the SPSI as a screening tool, and on technical considerations such as training and interpretations of findings.
3. We recommend mentorship of various forms be developed for substance prevention programs targeting Hong Kong students. Our experience in training and engagement of mentors can be used as a reference.
4. We recommend stronger emphasis of future interventions funded by the Beat Drugs Fund for substance prevention targeting students to be placed on development of secondary prevention programs. The screening instrument developed in this Project can be used for the purpose. Principles of program development used for the PAP, such as theory-based, evidence-based, stakeholder involvement, protective factors, positive and non-labeling framing, family and school involvements, should be given stronger consideration when funding such projects.
5. We recommend future substance use interventions targeting secondary school students to focus more on positive protective factors, including those deeper ones that are related to personal growth and family communication.

IX CONCLUSION

The PAP is an innovative secondary intervention that has shown some initial success and has created an evidence base for developing substance prevention programs targeting secondary school students in Hong Kong. One of its products, the SPSI, is potentially useful for designing future interventions. We believe strongly that it is greatly warranted to sustain and scale up PAP, and initial support has been obtained from relevant departments of the Hong Kong Government. The project attempts not only to offer a specific intervention, but has the implications of stimulating health workers and policy makers to consider new strategies that are required to prevent substance use among Hong Kong youths, such as investing more in secondary prevention, dealing with the deeply rooted needs of our youths, and walking through their journey with them. We sincerely believe that the PAP is an imperfect yet a good attempt to help the youth in Hong Kong, and that this should be the starting point rather than the end of a long-term endeavor. Dr Yuen Wan Choi and Professor Joseph Lau jointly started and developed the Understanding the Adolescent Project (UAP) more than a decade ago, which can now be used by all primary schools in Hong Kong and have been used by hundreds of schools in Hong Kong, with the same strong beliefs.

Table 1. Adjusted model of at risk substance use in the current study.

Risk Factor	OR _U	OR _M
Odds Ratio when all factors are equal to reference	-	4.157E-04
Age		
10 or below (Ref.)		
11	-	-
12	2.415E+07	101.278
13	3.421E+07	88.218
14	2.662E+07	57.511
15	2.508E+07	59.002
16	2.077E+07	36.239
17	4.129E+07	80.635
18	4.885E+07	72.351
19 or above	0.998	1.559
Type of living quarters		
Public housing estates (Ref.)		
Housing Authority Home Ownership estates	0.696	0.944
Private housing	0.906	1.225
Temporary housing	1.445	0.702
Others	1.188	1.532
Current use of alcohol		
No (Ref.)		
Yes	2.581***	0.725
Current use of tobacco		
No (Ref.)		
Yes	10.481***	2.155
Has friends/classmates who take psychoactive substances		
No (Ref.)		
Yes	9.932***	1.948
Has family members who take psychoactive substances		
No (Ref.)		
Yes	1.833	0.591
Degree of approval of people who take psychoactive substances for non-medical use regularly		
Strongly disapprove (Ref.)		
Disapprove	3.860***	1.822
Approve	16.183***	2.728
Strongly approve	48.128***	2.297

Risk Factor	OR _U	OR _M
Degree of approval of people who occasionally take psychoactive substances for non-medical use		
Strongly disapprove (Ref.)		
Disapprove	4.834***	1.506
Approve	9.576***	0.799
Strongly approve	45.359***	2.057
Degree of accessibility to psychoactive substances		
Don't know (Ref.)		
Very difficult	14.392***	7.180
Difficult	11.367***	5.806
Easy	10.459***	3.509
Very easy	14.975***	3.037
<u>Perceived harm</u>		
"Taking psychoactive substances is harmful to health"		
Agree (Ref.)		
Disagree	8.521***	3.117
"Psychoactive substance abuse destroys your future"		
Agree (Ref.)		
Disagree	6.154***	1.156
"The current publicity strategies for the prevention of psychoactive substance use are effective"		
Agree (Ref.)		
Disagree	1.868**	1.202
"Young people should try different things"		
Agree (Ref.)		
Disagree	0.217***	0.446
"I do not mind getting along with those who are abusing psychoactive substances"		
Agree (Ref.)		
Disagree	0.201***	1.051
"Nowadays, taking psychoactive substances is a hobby, just like smoking"		
Agree (Ref.)		
Disagree	0.233***	1.767
"I can control my consumption of psychoactive substances to avoid becoming addicted"		
Agree (Ref.)		
Disagree	0.323***	0.623

Risk Factor	OR _U	OR _M
Bullied by classmates/schoolmates		
No (Ref.)		
Yes	1.557	0.858
Involvement in triad society		
No (Ref.)		
Yes	10.822***	1.925
Playing truant		
No (Ref.)		
Yes	5.723***	1.246
Did not experience any problems in the past 6 months		
No (Ref.)		
Yes	0.442**	0.792
Influenced by peers		
Rarely (Ref.)		
Not quite	0.403	0.514
Sometimes	0.480**	0.757
Quite	0.509**	0.831
Very much	1.247	0.851
Parents alive or deceased?		
Parents are still alive (Ref.)		
Either father or mother was deceased	1.916	1.468
Both parents were deceased	3.650E-08	-
Living with parents		
Both parents are living with the child (Ref.)		
Only father or mother is living with the child	2.413***	1.368
Both parents are not living with the child	0.510	0.341
Parents don't understand their children		
Very dissimilar (Ref.)		
Somewhat dissimilar	0.675	1.364
Somewhat similar	0.847	1.599
Very similar	2.086*	1.640
Parents don't want to listen to their children's problems		
Very dissimilar (Ref.)		
Somewhat dissimilar	0.773	0.716
Somewhat similar	1.202	0.810
Very similar	2.499*	0.884

Risk Factor	OR _U	OR _M
Parents value their children very much		
Very dissimilar (Ref.)		
Somewhat dissimilar	0.430*	0.580
Somewhat similar	0.217***	0.456
Very similar	0.171***	0.469
Parents don't like the way their children behave		
Very dissimilar (Ref.)		
Somewhat dissimilar	0.435***	0.859
Somewhat similar	0.349***	0.875
Very similar	0.630	1.352
Cognition on psychoactive substances		
Cues to action	3.670***	-
Severity	0.333***	-
Perceived benefits +	3.489***	1.456
Perceived barriers	0.807*	-
Subjective norm	0.644***	-
Perceived behavioral control	3.552***	-
Family-related factors		
Family conflict	1.942***	-
Family satisfaction	0.747**	-
School-related factor		
Academic aspiration+	0.414***	0.651
Psychological factors		
Sensation seeking	2.285***	-
Depression	1.927***	-

* p<0.05; ** p<0.01; *** p<0.001, + newly added factors into the ACAN 2000/01 screening model

Table 2. Background characteristics of psychoactive substance users and non-users for the SPSI validation study.

	Non psychoactive substance users (n=50)	Psychoactive substance users (n=50)	p*
	COL %	COL %	
Gender			
Male	56.0	58.0	0.84
Female	44.0	42.0	
Form			
1	6.0	6.0	0.75
2	36.0	36.0	
3	24.0	24.0	
4	26.0	26.0	
5	8.0	4.0	
Quit school	0	4.0	
Age			0.15
13	16.0	10.0	
14	38.0	22.0	
15	18.0	16.0	
16	18.0	28.0	
17	10.0	18.0	
18	0	6.0	
Housing Type			0.085
Non-private housing	60.0	64.0	
Private housing	40.0	36.0	

* p-value obtained by χ^2 test

Table 3. Between-group comparison of background variables at baseline.

	Intervention (n=154)	Control (n=124)	p*
	COL %	COL %	
Gender			
Male	70.1	68.5	0.776
Female	29.9	31.5	
Form			0.136
1	59.7	50.8	
2	40.3	49.2	
Housing Type			0.536
Non-private housing	58.4	62.1	
Private housing	41.6	37.9	

* p-value obtained by χ^2 test

Table 4. Between-group comparison of other studied variables at baseline.

Outcome indicators/scale	Intervention (I)		Control (C)		(I – C)	
	n	Mean score (s.d.)	n	Mean score (s.d.)	Group difference	p*
<u>Substance-related variables</u>						
Subjective norm for using psychoactive substances	136	1.48 (1.01)	124	1.97 (1.27)	-0.50	<0.001#
Perceived behavioural control (Norman and Conner Scale)	136	5.74 (1.28)	124	5.79 (1.26)	-0.05	0.737
Substance avoidance self-efficacy	136	5.36 (1.50)	124	5.27 (1.45)	0.09	0.630
Negative attitudes towards psychoactive substances (From ACAN study)	154	2.26 (0.55)	124	2.29 (0.64)	-0.03	0.664
<u>Other potential risk and protective factors</u>						
Self-esteem	154	2.51 (0.49)	123	2.45 (0.42)	0.06	0.305#
Self-control	136	2.93 (0.38)	123	3.00 (0.43)	-0.06	0.222
Life goal	154	5.16 (1.14)	123	4.60 (1.28)	0.56	<0.001
Resilience	154	3.25 (0.65)	123	3.21 (0.72)	0.04	0.638
Self-efficacy	154	2.47 (0.62)	124	2.47 (0.71)	0.00	0.989
Family function	154	3.12 (0.96)	124	2.89 (0.98)	0.23	0.051
Responsibility	142	3.52 (0.55)	123	3.18 (0.58)	0.35	<0.001
Career aspiration	154	3.22 (0.98)	124	2.94 (0.96)	0.28	0.016
Academic aspiration	154	3.48 (0.78)	123	3.32 (0.81)	0.17	0.084

* p-value obtained by 2 sample t-test with equal variance assumption

Unequal variance assumption was used because p-value of Levene's test for Equality of Variances is smaller than 0.05

† p-value obtained by ANCOVA with baseline score being taken as covariate

Table 5. Comparison of baseline socio-demographic characteristics between drop-outs and non-drop-outs at post-intervention (T1) and three-month follow-up (T2).

	Time of drop-out	Intervention		p*	Control		p*
		Drop-outs	Non-drop-outs		Drop-outs	Non-drop-outs	
		COL %	COL %		COL %	COL %	
<u>Socio-demographic variables</u>							
Gender	T1			0.060			0.760
Male		85.2	66.9		66.7	69.4	
Female		14.8	33.1		33.3	30.6	
	T2			0.099			0.311
Male		82.8	67.2		63.0	71.8	
Female		17.2	32.8		37.0	28.2	
Form	T1			0.955			0.276
1		59.3	59.8		43.6	54.1	
2		40.7	40.2		56.4	45.9	
	T2			0.329			0.890
1		51.7	61.6		50.0	51.3	
2		48.3	38.4		50.0	48.7	
Housing Type	T1			0.070			0.377
Non-private housing		74.1	55.1		56.4	64.7	
Private housing		25.9	44.9		43.6	35.3	
	T2			0.035			0.549
Non-private housing		75.9	54.4		58.7	64.1	
Private housing		24.1	45.6		41.3	35.9	

* p-value obtained by χ^2 test

Table 6. Comparison of baseline characteristics between drop-outs and non-drop-outs at post-intervention (T1) and three-month follow-up(T2).

	At	Intervention			Control		
		Drop-outs	Non-drop-outs	p*	Drop-outs	Non-drop-outs	p*
		mean (s.d.)	mean (s.d.)		mean (s.d.)	mean (s.d.)	
<u>Substance-related variables</u>							
Subjective norm for using psychoactive substances	T1	1.74 (1.07)	1.42 (1.00)	0.156	2.18 (1.31)	1.88 (1.25)	0.216
	T2	1.61 (1.02)	1.45 (1.01)	0.475	2.20 (1.30)	1.84 (1.25)	0.138
Perceived behavioural control (Norman and Conner Scale)	T1	5.69 (1.11)	5.75 (1.31)	0.841	5.93 (1.27)	5.72 (1.26)	0.402
	T2	5.74 (1.16)	5.73 (1.30)	0.986	5.80 (1.19)	5.78 (1.32)	0.914
Substance avoidance self-efficacy	T1	4.78 (1.31)	5.48 (1.50)	0.025#	5.06 (1.46)	5.37 (1.45)	0.276
	T2	5.16 (1.42)	5.25 (1.51)	0.480	5.25 (1.39)	5.28 (1.50)	0.918
Negative attitudes towards psychoactive substances (From ACAN study)	T1	2.38 (0.63)	2.23 (0.52)	0.201	2.36 (0.72)	2.26 (0.61)	0.415
	T2	2.37 (0.69)	2.23 (0.51)	0.226	2.34 (0.67)	2.26 (0.63)	0.514
<u>Other potential risk and protective factors</u>							
Self-esteem	T1	2.45 (0.38)	2.52 (0.51)	0.523	2.48 (0.39)	2.43 (0.44)	0.565
	T2	2.40 (0.33)	2.53 (0.52)	0.195	2.43 (0.48)	2.46 (0.39)	0.700
Self-control	T1	2.96 (0.41)	2.93 (0.38)	0.725	3.01 (0.41)	2.99 (0.44)	0.784
	T2	2.91 (0.45)	2.93 (0.37)	0.789	2.96 (0.36)	3.01 (0.46)	0.562
Life goal	T1	5.00 (0.97)	5.20 (1.17)	0.410	4.58 (1.04)	4.61 (1.38)	0.928
	T2	5.03 (0.99)	5.19 (1.17)	0.496	4.52 (1.07)	4.65 (1.39)	0.601
Resilience	T1	3.24 (0.67)	3.25 (0.65)	0.934	3.21 (0.50)	3.22 (0.80)	0.957#
	T2	3.24 (0.62)	3.26 (0.66)	0.919	3.22 (0.60)	3.21 (0.78)	0.899
Self-efficacy	T1	2.50 (0.62)	2.46 (0.62)	0.780	2.46 (0.81)	2.47 (0.67)	0.920
	T2	2.49 (0.64)	2.47 (0.62)	0.868	2.55 (0.73)	2.42 (0.71)	0.344
Family function	T1	3.15 (0.89)	3.12 (0.98)	0.861	2.74 (0.95)	2.96 (1.00)	0.233
	T2	3.03 (0.91)	3.14 (0.98)	0.574	2.86 (0.99)	2.91 (0.98)	0.788
Responsibility	T1	3.25 (0.50)	3.59 (0.55)	0.005	3.14 (0.49)	3.20 (0.62)	0.625
	T2	3.31 (0.52)	3.57 (0.55)	0.036	3.13 (0.45)	3.21 (0.65)	0.413#
Career aspiration	T1	3.42 (0.85)	3.18 (1.00)	0.251	3.17 (1.00)	2.83 (0.93)	0.071
	T2	3.41 (0.83)	3.18 (1.01)	0.251	2.87 (1.03)	2.98 (0.92)	0.556
Academic aspiration	T1	3.33 (0.89)	3.51 (0.76)	0.276	3.25 (0.56)	3.35 (0.91)	0.490#
	T2	3.34 (0.85)	3.52 (0.77)	0.293	3.22 (0.77)	3.37 (0.85)	0.302

* p-value obtained by 2 sample t-test with equal variance assumption

Unequal variance assumption was used because p-value of Levene's test for Equality of Variances is smaller than 0.05

Table 7. Between group comparisons at post-intervention (T1) and three-month follow up (T2).

Outcome indicators/scale	t	Intervention (I)		Control (C)		(I – C) Group difference	p*	p†
		n	Mean score (s.d.)	n	Mean score (s.d.)			
<u>Substance-related variables</u>								
Subjective norm for using psychoactive substances	T0	136	1.48 (1.01)	124	1.97 (1.27)	-0.50	<0.001#	-
	T1	127	1.40 (0.88)	85	2.15 (1.51)	-0.75	<0.001#	<0.001
	T2	125	1.58 (1.07)	78	1.81 (1.37)	-0.23	0.189	0.232
Subjective norm for not using psychoactive substances	T0	-	-	-	-	-	-	-
	T1	127	3.02 (1.03)	85	2.97 (0.99)	0.05	0.715	-
	T2	125	3.15 (0.91)	78	2.92 (1.08)	0.23	0.108	-
Perceived behavioural control (Norman and Conner Scale)	T0	136	5.74 (1.28)	124	5.79 (1.26)	-0.05	0.737	-
	T1	127	6.30 (1.25)	85	5.92 (1.47)	0.38	0.051#	-
	T2	125	6.32 (1.14)	78	6.18 (1.36)	0.14	0.431	-
Perceived behavioural control (self constructed items)	T0	-	-	-	-	-	-	-
	T1	127	4.66 (0.63)	85	4.25 (1.02)	0.40	0.001#	-
	T2	125	4.63 (0.64)	78	4.37 (1.00)	0.26	0.040#	-
Substance avoidance self-efficacy	T0	136	5.36 (1.50)	124	5.27 (1.45)	0.09	0.630	-
	T1	127	5.83 (1.46)	85	5.34 (1.60)	0.49	0.024#	-
	T2	125	6.04 (1.30)	78	5.58 (1.51)	0.46	0.027#	-
Negative attitudes towards psychoactive substances (From ACAN study)	T0	154	2.26 (0.55)	124	2.29 (0.64)	-0.03	0.664	-
	T1	127	2.38 (0.64)	85	2.35 (0.66)	0.04	0.699	-
	T2	125	2.33 (0.58)	77	2.46 (0.73)	-0.13	0.177	-
Negative attitudes towards psychoactive substances (self constructed items)	T0	-	-	-	-	-	-	-
	T1	127	3.15 (0.47)	85	2.96 (0.51)	0.19	0.006	-
	T2	125	3.24 (0.47)	77	2.95 (0.48)	0.29	<0.001	-
<u>Other potential risk and protective factors</u>								
Self-esteem	T0	154	2.51 (0.49)	123	2.45 (0.42)	0.06	0.305#	-
	T1	127	2.72 (0.37)	85	2.48 (0.42)	0.24	<0.001	-
	T2	125	2.73 (0.38)	78	2.50 (0.39)	0.23	<0.001	-
Self-control	T0	136	2.93 (0.38)	123	3.00 (0.43)	-0.06	0.222	-
	T1	127	2.91 (0.41)	85	2.92 (0.42)	-0.01	0.897	-
	T2	125	2.91 (0.36)	78	2.99 (0.45)	-0.08	0.168	-
Life goal	T0	154	5.16 (1.14)	123	4.60 (1.28)	0.56	<0.001	-
	T1	127	5.20 (1.27)	85	4.80 (1.48)	0.41	0.031	0.126
	T2	125	5.32 (1.25)	78	5.13 (1.45)	0.19	0.314	0.835
Resilience	T0	154	3.25 (0.65)	123	3.21 (0.72)	0.04	0.638	-
	T1	127	3.50 (0.64)	85	3.25 (0.82)	0.26	0.011	-
	T2	125	3.53 (0.63)	77	3.24 (0.82)	0.30	0.004#	-
Self-efficacy	T0	154	2.47 (0.62)	124	2.47 (0.71)	0.00	0.989	-
	T1	127	2.67 (0.62)	85	2.51 (0.77)	0.15	0.109	-
	T2	125	2.78 (0.59)	78	2.58 (0.85)	0.19	0.081#	-

Outcome indicators/scale	t	Intervention (I)		Control (C)		(I – C) Group difference	p*	p†
		n	Mean score (s.d.)	n	Mean score (s.d.)			
Family function	T0	154	3.12 (0.96)	124	2.89 (0.98)	0.23	0.051	-
	T1	127	3.38 (0.85)	85	3.13 (1.02)	0.26	0.049	0.094
	T2	125	3.32 (0.95)	78	2.93 (1.02)	0.39	0.007	0.028
Responsibility	T0	142	3.52 (0.55)	123	3.18 (0.58)	0.35	<0.001	-
	T1	127	3.60 (0.59)	85	3.35 (0.60)	0.25	0.003	0.148
	T2	125	3.53 (0.62)	78	3.24 (0.64)	0.29	0.002	0.139
Career aspiration	T0	154	3.22 (0.98)	124	2.94 (0.96)	0.28	0.016	-
	T1	127	3.26 (0.84)	85	2.94 (0.93)	0.32	0.010	0.068
	T2	125	3.27 (0.89)	78	2.86 (1.02)	0.41	0.003	0.006
Academic aspiration	T0	154	3.48 (0.78)	123	3.32 (0.81)	0.17	0.084	-
	T1	127	3.77 (0.76)	85	3.46 (0.91)	0.31	0.010#	0.011
	T2	125	3.78 (0.73)	78	3.34 (0.98)	0.45	<0.001#	<0.001

* p-value obtained by 2 sample t-test with equal variance assumption

Unequal variance assumption was used because p-value of Levene's test for Equality of Variances is smaller than 0.05

† p-value obtained by ANCOVA with baseline score being taken as covariate

Table 8. Within group comparisons between post-intervention (T1), three-month follow-up (T2), and baseline measures (T0).

Outcome indicators/scale	t	Intervention group (I)				Control group (C)			
		n	Mean score (s.d.)	Change of mean score (s.d.)	p*	n	Mean score (s.d.)	Change of mean score (s.d.)	p*
<u>Substance-related variables</u>									
Subjective norm for using psychoactive substances	T0	112	1.42 (1.00)	-0.03 (1.16)	0.756	85	1.88 (1.25)	0.27 (1.90)	0.199
	T1	112	1.39 (0.87)			85	2.15 (1.51)		
	T0	112	1.45 (1.01)	0.08 (1.18)	0.465	78	1.84 (1.25)	-0.04 (1.80)	0.851
	T2	112	1.53 (0.99)			78	1.81 (1.37)		
Perceived behavioural control (Norman and Conner Scale)	T0	112	5.75 (1.31)	0.58 (1.42)	<0.001	85	5.72 (1.26)	0.20 (1.94)	0.351
	T1	112	6.33 (1.23)			85	5.92 (1.47)		
	T0	112	5.73 (1.30)	0.61 (1.39)	<0.001	78	5.78 (1.32)	0.40 (1.69)	0.041
	T2	112	6.35 (1.11)			78	6.18 (1.36)		
Substance avoidance self-efficacy	T0	112	5.48 (1.50)	0.37 (1.71)	0.025	85	5.37 (1.45)	-0.03 (1.83)	0.874
	T1	112	5.85 (1.48)			85	5.34 (1.60)		
	T0	112	5.40 (1.51)	0.76 (1.64)	<0.001	78	5.28 (1.50)	0.30 (1.74)	0.139
	T2	112	6.17 (1.21)			78	5.58 (1.51)		
Negative attitudes towards psychoactive substances (From ACAN study)	T0	127	2.23 (0.53)	0.15 (0.75)	0.024	85	2.26 (0.61)	0.09 (0.90)	0.356
	T1	127	2.38 (0.64)			85	2.35 (0.66)		
	T0	125	2.23 (0.51)	0.09 (0.73)	0.145	77	2.26 (0.63)	0.20 (1.03)	0.102
	T2	125	2.32 (0.58)			77	2.46 (0.73)		
<u>Other potential risk and protective factors</u>									
Self-esteem	T0	127	2.52 (0.51)	0.20 (0.50)	<0.001	84	2.43 (0.44)	0.05 (0.53)	0.435
	T1	127	2.72 (0.37)			84	2.48 (0.42)		
	T0	125	2.53 (0.52)	0.20 (0.55)	<0.001	77	2.46 (0.39)	0.03 (0.39)	0.539
	T2	125	2.73 (0.38)			77	2.49 (0.39)		
Self-control	T0	112	2.93 (0.38)	-0.03 (0.44)	0.453	84	2.99 (0.44)	-0.06	0.269
	T1	112	2.89 (0.41)			84	2.93 (0.42)		
	T0	112	2.93 (0.37)	-0.03 (0.42)	0.338	77	3.01 (0.46)	-0.01	0.812
	T2	112	2.90 (0.33)			77	3.00 (0.45)		
Life goal	T0	127	5.20 (1.17)	0.01 (1.54)	0.970	84	4.61 (1.38)	0.16 (1.74)	0.410
	T1	127	5.20 (1.27)			84	4.76 (1.47)		
	T0	125	5.19 (1.17)	0.13 (1.28)	0.260	77	4.65 (1.39)	0.46 (1.84)	0.032
	T2	125	5.32 (1.25)			77	5.11 (1.45)		

Outcome indicators/scale	t	Intervention group (I)				Control group (C)																																																																																																																																																																			
		n	Mean score (s.d.)	Change of mean score (s.d.)	p*	n	Mean score (s.d.)	Change of mean score (s.d.)	p*																																																																																																																																																																
Resilience	T0	127	3.25 (0.65)	0.25 (0.69)	<0.001	84	3.22 (0.80)	0.01 (1.03)	0.936																																																																																																																																																																
	T1	127	3.50 (0.64)			84	3.22 (0.80)				T0	125	3.26 (0.66)	0.28 (0.80)	<0.001	76	3.23 (0.77)	-0.01 (0.92)	0.929	T2	125	3.53 (0.63)	76	3.22 (0.81)	Self-efficacy	T0	127	2.46 (0.62)	0.20 (0.71)	0.001	85	2.47 (0.67)	0.04 (0.86)	0.670	T1	127	2.67 (0.62)	85	2.51 (0.77)		T0	125	2.47 (0.62)	0.31 (0.73)	<0.001	78	2.42 (0.71)	0.16 (0.78)	0.071	T2	125	2.78 (0.59)	78	2.58 (0.85)	Family function	T0	127	3.12 (0.98)	0.27 (1.05)	0.005	85	2.96 (1.00)	0.16 (1.07)	0.159	T1	127	3.38 (0.85)	85	3.13 (1.02)		T0	125	3.14 (0.98)	0.18 (1.03)	0.059	78	2.91 (0.98)	0.02 (1.05)	0.855	T2	125	3.32 (0.95)	78	2.93 (1.02)	Responsibility	T0	112	3.59 (0.55)	0.01 (0.63)	0.837	84	3.20 (0.62)	0.14 (0.74)	0.076	T1	112	3.60 (0.59)	84	3.34 (0.60)		T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701	T2	112	3.54 (0.61)	77	3.24 (0.65)	Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621
	T0	125	3.26 (0.66)	0.28 (0.80)	<0.001	76	3.23 (0.77)	-0.01 (0.92)	0.929																																																																																																																																																																
	T2	125	3.53 (0.63)			76	3.22 (0.81)			Self-efficacy	T0	127	2.46 (0.62)	0.20 (0.71)	0.001	85	2.47 (0.67)	0.04 (0.86)	0.670	T1	127	2.67 (0.62)	85	2.51 (0.77)		T0	125	2.47 (0.62)	0.31 (0.73)	<0.001	78	2.42 (0.71)	0.16 (0.78)	0.071	T2	125	2.78 (0.59)	78	2.58 (0.85)	Family function	T0	127	3.12 (0.98)	0.27 (1.05)	0.005	85	2.96 (1.00)	0.16 (1.07)	0.159	T1	127	3.38 (0.85)	85	3.13 (1.02)		T0	125	3.14 (0.98)	0.18 (1.03)	0.059	78	2.91 (0.98)	0.02 (1.05)	0.855	T2	125	3.32 (0.95)	78	2.93 (1.02)	Responsibility	T0	112	3.59 (0.55)	0.01 (0.63)	0.837	84	3.20 (0.62)	0.14 (0.74)	0.076	T1	112	3.60 (0.59)	84	3.34 (0.60)		T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701	T2	112	3.54 (0.61)	77	3.24 (0.65)	Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)										
Self-efficacy	T0	127	2.46 (0.62)	0.20 (0.71)	0.001	85	2.47 (0.67)	0.04 (0.86)	0.670																																																																																																																																																																
	T1	127	2.67 (0.62)			85	2.51 (0.77)				T0	125	2.47 (0.62)	0.31 (0.73)	<0.001	78	2.42 (0.71)	0.16 (0.78)	0.071	T2	125	2.78 (0.59)	78	2.58 (0.85)	Family function	T0	127	3.12 (0.98)	0.27 (1.05)	0.005	85	2.96 (1.00)	0.16 (1.07)	0.159	T1	127	3.38 (0.85)	85	3.13 (1.02)		T0	125	3.14 (0.98)	0.18 (1.03)	0.059	78	2.91 (0.98)	0.02 (1.05)	0.855	T2	125	3.32 (0.95)	78	2.93 (1.02)	Responsibility	T0	112	3.59 (0.55)	0.01 (0.63)	0.837	84	3.20 (0.62)	0.14 (0.74)	0.076	T1	112	3.60 (0.59)	84	3.34 (0.60)		T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701	T2	112	3.54 (0.61)	77	3.24 (0.65)	Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)																									
	T0	125	2.47 (0.62)	0.31 (0.73)	<0.001	78	2.42 (0.71)	0.16 (0.78)	0.071																																																																																																																																																																
	T2	125	2.78 (0.59)			78	2.58 (0.85)			Family function	T0	127	3.12 (0.98)	0.27 (1.05)	0.005	85	2.96 (1.00)	0.16 (1.07)	0.159	T1	127	3.38 (0.85)	85	3.13 (1.02)		T0	125	3.14 (0.98)	0.18 (1.03)	0.059	78	2.91 (0.98)	0.02 (1.05)	0.855	T2	125	3.32 (0.95)	78	2.93 (1.02)	Responsibility	T0	112	3.59 (0.55)	0.01 (0.63)	0.837	84	3.20 (0.62)	0.14 (0.74)	0.076	T1	112	3.60 (0.59)	84	3.34 (0.60)		T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701	T2	112	3.54 (0.61)	77	3.24 (0.65)	Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)																																								
Family function	T0	127	3.12 (0.98)	0.27 (1.05)	0.005	85	2.96 (1.00)	0.16 (1.07)	0.159																																																																																																																																																																
	T1	127	3.38 (0.85)			85	3.13 (1.02)				T0	125	3.14 (0.98)	0.18 (1.03)	0.059	78	2.91 (0.98)	0.02 (1.05)	0.855	T2	125	3.32 (0.95)	78	2.93 (1.02)	Responsibility	T0	112	3.59 (0.55)	0.01 (0.63)	0.837	84	3.20 (0.62)	0.14 (0.74)	0.076	T1	112	3.60 (0.59)	84	3.34 (0.60)		T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701	T2	112	3.54 (0.61)	77	3.24 (0.65)	Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)																																																							
	T0	125	3.14 (0.98)	0.18 (1.03)	0.059	78	2.91 (0.98)	0.02 (1.05)	0.855																																																																																																																																																																
	T2	125	3.32 (0.95)			78	2.93 (1.02)			Responsibility	T0	112	3.59 (0.55)	0.01 (0.63)	0.837	84	3.20 (0.62)	0.14 (0.74)	0.076	T1	112	3.60 (0.59)	84	3.34 (0.60)		T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701	T2	112	3.54 (0.61)	77	3.24 (0.65)	Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)																																																																						
Responsibility	T0	112	3.59 (0.55)	0.01 (0.63)	0.837	84	3.20 (0.62)	0.14 (0.74)	0.076																																																																																																																																																																
	T1	112	3.60 (0.59)			84	3.34 (0.60)				T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701	T2	112	3.54 (0.61)	77	3.24 (0.65)	Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)																																																																																					
	T0	112	3.57 (0.55)	-0.04 (0.59)	0.521	77	3.21 (0.65)	0.03 (0.74)	0.701																																																																																																																																																																
	T2	112	3.54 (0.61)			77	3.24 (0.65)			Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352	T1	127	3.26 (0.84)	85	2.94 (0.93)		T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)																																																																																																				
Career aspiration	T0	127	3.18 (1.00)	0.07 (1.12)	0.456	85	2.84 (0.93)	0.10 (1.02)	0.352																																																																																																																																																																
	T1	127	3.26 (0.84)			85	2.94 (0.93)				T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278	T2	125	3.27 (0.89)	78	2.86 (1.02)	Academic aspiration	T0	127	3.52 (0.76)	0.26 (0.86)	0.001	84	3.35 (0.91)	0.10 (1.22)	0.476	T1	127	3.77 (0.76)	84	3.44 (0.90)		T0	125	3.52 (0.77)	0.27 (0.80)	<0.001	77	3.37 (0.85)	0.06 (1.08)	0.621	T2	125	3.78 (0.73)	77	3.31 (0.97)																																																																																																																			
	T0	125	3.18 (1.01)	0.09 (1.31)	0.462	78	3.00 (0.93)	-0.12 (0.99)	0.278																																																																																																																																																																
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	T2	125	3.78 (0.73)			77	3.31 (0.97)																																																																																																																																																																		

* p-value obtained by paired t-test for testing within group change

Unequal variance assumption was used because p-value of Levene's test for Equality of Variances is smaller than 0.05

Table 9. Subjective evaluation among students (mentorship program) (n=73).

After the mentorship program...	Strongly agree	Agree	Disagree	Strongly disagree
1. I feel that I am supported and encouraged by my mentor	51%	48%	1%	0%
2. I want to learn the positive attributes of the mentors (e.g. having positive goals, overcoming difficulties, willing to help others)	47%	52%	1%	0%
3. Mentors are helping my search for goal and direction	48%	51%	1%	0%
4. Mentors help me discover more of my strengths and capabilities	47%	52%	1%	0%
5. Mentors help me become more responsible	45%	53%	1%	0%
6. I am more willing to share with others and seek help	51%	45%	4%	0%
7. I believe that I am more able to build healthy interpersonal relationships	52%	45%	3%	0%
8. I am satisfied with the mentorship program	59%	41%	0%	0%

Table 10. Subjective evaluation among students (path-finding workshops) (n=96).

After the path-finding workshops...	Strongly agree	Agree	Disagree	Strongly disagree
1. I have a better understanding of my academic and career orientation	19.8%	68.8%	11.5%	0%
2. I know more about the different study paths (e.g. vocational training, diploma and university)	22.9%	68.8%	8.3%	0%
3. I know more about the actual work environment	19.8%	71.9%	7.3%	1.0%
4. I feel that I have different choices and paths (e.g. study, career and others)	22.9%	65.6%	11.5%	0%
5. I can set a clear goal and direction for the future (e.g. study, career and others)	27.1%	60.4%	12.5%	0%
6. I feel that the future is full of hope	25%	67.7%	7.3%	0%
7. I am satisfied with the path-finding workshops	35.4%	56.3%	8.3%	0%

Table 11. Subjective evaluation among students (personal growth workshops) (n=96).

After the personal growth workshops...	Strongly agree	Agree	Disagree	Strongly disagree
1. I feel that I am supported and accepted by my classmates	27.1%	63.5%	9.4%	0%
2. I feel that I am supported and accepted by the program leaders	36.5%	58.3%	5.2%	0%
3. I understand that my thoughts, feelings, and behaviors affect each other	26.0%	67.7%	6.3%	0%
4. I understand that sometimes I will have irrational thoughts, for example, overestimating the negative side or predicting that I will certainly fail	21.9%	63.5%	12.5%	2.1%
5. I feel that I have the ability to change my thinking, e.g. thinking more positively and rationally	31.3%	59.4%	8.3%	1.0%
6. I feel that I have the ability to resist temptations	31.3%	59.4%	9.4%	0%
7. I feel that I have the ability to control my emotions	31.3%	61.5%	7.3%	0%
8. I am satisfied with the personal growth workshops	32.3%	60.4%	7.3%	0%

Table 12. Subjective evaluation among students (intensive training camp) (n=96).

After the intensive training camp...	Strongly agree	Agree	Disagree	Strongly disagree
1. I learn the fire services spirit from the firemen, e.g. team spirit, being willing to give and to hold on	49.0%	42.7%	7.3%	0%
2. I feel that I have certain responsibilities	43.8%	49.0%	5.2%	0%
3. I feel that I have the spirit of “never give up, hold on till the end”, and being able to achieve the goal	44.8%	47.9%	5.2%	1.0%
4. I feel that I have the ability to face future difficulties and challenges	44.8%	47.9%	5.2%	1.0%
5. I am satisfied with the 4-day 3-night intensive training camp	44.8%	47.9%	5.2%	1.0%

Table 13. Subjective evaluation among students (overall intervention) (n=72).

	Strongly agree	Agree	Disagree	Strongly disagree
Academic aspiration				
1. I understand better that even though I can't get into university, there are still other paths I can take	50%	47%	3%	0%
2. I want to strive for better academic results	54%	44%	1%	0%
3. I am more interested in studying	39%	50%	10%	1%
Life goal				
4. I begin to think about my own future	51%	49%	0%	0%
5. I have a clearer goal about my future	40%	57%	1%	1%
6. I am more hopeful about my future	44%	54%	1%	0%
7. I hope to have a positive and meaningful life	56%	42%	3%	0%
Personal Competence				
8. I discover more about my strengths	49%	49%	3%	0%
9. My ability to solve problems has improved	50%	49%	1%	0%
10. I have more confidence to overcome difficulties	46%	54%	0%	0%
11. I am more able to hold on till the end	51%	49%	0%	0%
Responsibility				
12. I am more responsible	49%	51%	0%	0%
13. I am more self-disciplined	49%	51%	0%	0%
14. I take more into account other people's feelings	44%	56%	0%	0%
Support from others				
15. I have a role model whom I can learn from	49%	51%	0%	0%
16. I have more friends who have positive attitudes toward life	53%	46%	0%	1%
17. I feel that friends/ mentors care about me	45%	54%	1%	0%
18. I feel that friends/ mentors support and encourage me	46%	52%	1%	0%
19. I feel that friends/ mentors appreciate and accept me	45%	52%	3%	0%
Family relationship				
20. I feel that my family understands my needs better	38%	55%	7%	0%
21. I feel that my family supports and encourages me more	41%	54%	6%	0%
22. I feel that my family appreciates and accepts me more	39%	54%	6%	1%
23. My friends think that I have made progress	35%	58%	6%	1%
24. I communicate with my family better	39%	56%	3%	1%
25. My relationship with my family has been improved	42%	52%	4%	1%
Substance-related cognition				
26. I am more aware of the harmful effects of psychoactive substances	55%	45%	0%	0%

	Strongly agree	Agree	Disagree	Strongly disagree
27. I understand more clearly that psychoactive substances are highly addictive	58%	42%	0%	0%
28. I know more how to refuse psychoactive substances	56%	44%	0%	0%
29. I am more certain that I won't take psychoactive substances in the future	63%	37%	0%	0%
Overall evaluation of the PAP				
30. Overall, I am satisfied with the PAP	54%	46%	0%	0%

Table 14. Subjective evaluation among parents (n=43).

	Strongly agree	Agree	Disagree	Strongly disagree
After the workshop session about parenting...				
1. I have a better understanding of the principles of parenting	35%	65%	0%	0%
2. I know more how to strike a balance between “love” and “discipline”	37%	61%	2%	0%
3. I know more how to build a healthy and intimate relationship with my child(ren)	37%	63%	0%	0%
4. I am satisfied with the performance of the speaker	52%	48%	0%	0%
After the workshop session about Internet addiction...				
5. I have a better understanding of the situation and impact of Internet addiction among adolescents	40%	60%	0%	0%
6. I am more able to detect whether my child(ren) is/are addicted to the Internet	30%	70%	0%	0%
7. I know more ways to help deal with the probable Internet addiction problem of my child(ren)	35%	63%	2%	0%
8. I am more able to actively deal with the behavioral problem of my child(ren)	44%	56%	0%	0%
9. I am more able to deal with my emotional problems	35%	65%	0%	0%
10. I am satisfied with the performance of the speaker	65%	35%	0%	0%
After the workshop session about psychoactive substance use...				
11. I have a better understanding of the names, the impact and the methods of consumption of the psychoactive substances most commonly used among adolescents.	14%	84%	2%	0%
12. I have a better understanding of how to prevent my child(ren) from using psychoactive substances	14%	86%	0%	0%
13. I am more able to detect whether my child(ren) has/have used psychoactive substances	18%	77%	5%	0%
14. I know more ways to help deal with the probable psychoactive substance use of my child(ren)	16%	75%	7%	0%
15. I have a better understanding of the characteristics of adolescents and adolescent pop culture	23%	74%	2%	0%
16. I am more able to communicate with my child(ren)	16%	82%	2%	0%
17. I am more able to deal with conflicts with my child(ren)	18%	77%	5%	0%
18. I can use rewards and punishments to deal with my child(ren)’s behavior more effectively	14%	84%	2%	0%
19. I am more able to actively face the behavioral problem of my child(ren)	28%	72%	0%	0%
20. I am more able to deal with my emotional problems	21%	79%	0%	0%
21. I am satisfied with the performance of the speaker	44%	56%	0%	0%

	Strongly agree	Agree	Disagree	Strongly disagree
Overall comment on the format of the workshop				
22. The time of the workshop is appropriate	30%	61%	9%	0%
23. The venue of the workshop is appropriate	26%	63%	12%	0%
24. The content of the workshop is appropriate	39%	58%	3%	0%

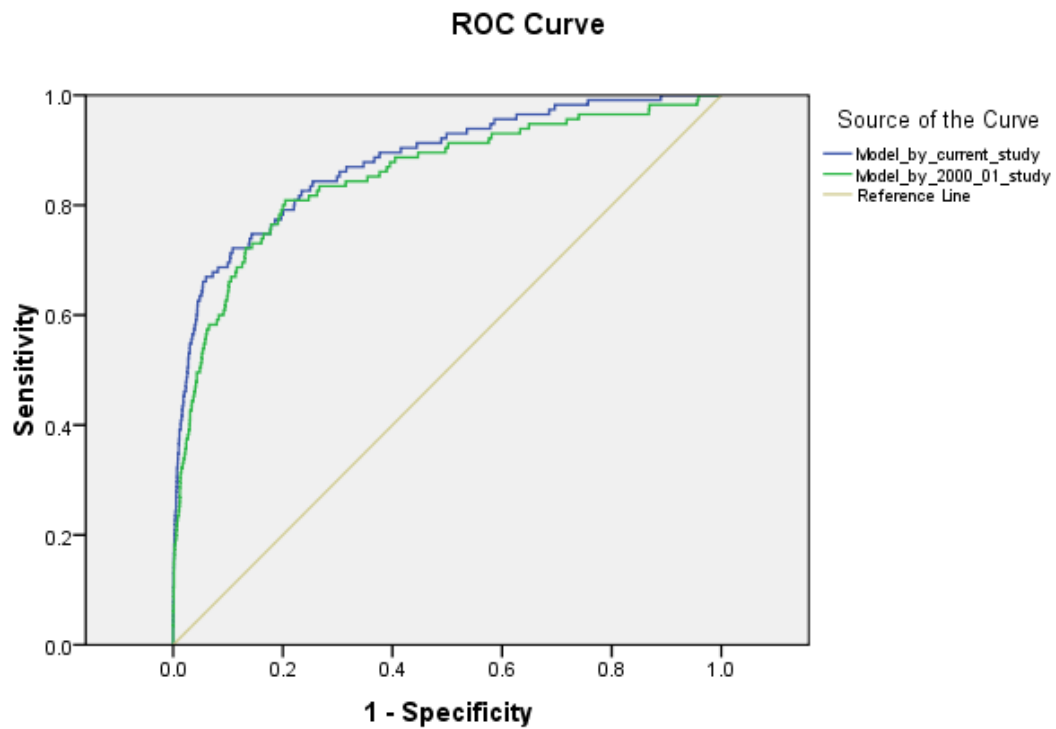
Table 15. Subjective evaluation among mentors (the mentorship training) (n=94).

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. The training has increased my understanding of cross-generational relationship, cross-generational poverty and positive adolescent development	35%	63%	2%	0%	0%
2. The training has increased my understanding of the qualities of a good mentor, and helped me develop my attributes	39%	60%	1%	0%	0%
3. The training has increased my understanding of psychoactive substance use among adolescents	28%	62%	10%	0%	0%
4. The training has increased my understanding of mental health among adolescents	21%	72%	7%	0%	0%
5. The training has improved my communication skills with adolescents	31%	63%	6%	0%	0%
6. The training has inspired me to help adolescents, and get to know how to seek help when needed	32%	63%	5%	0%	0%
7. The training has increased my understanding of the implementation of PAP mentorship program	39%	56%	5%	0%	0%
8. The training has increased my motivation to become a mentor	30%	61%	9%	0%	0%
9. I participated actively in the training	38%	60%	2%	0%	0%
10. Overall, I am satisfied with the mentorship training	45%	53%	2%	0%	0%

Table 16. Subjective evaluation among mentors (overall intervention) (n=50).

	Strongly agree	Agree	Disagree	Strongly disagree	NA
1. I feel that PAP is helpful to students/ mentees	42%	58%	0%	0%	0%
2. I discovered more of my strengths and capabilities	12%	76%	6%	0%	6%
3. I will take more into account other people's thoughts and feelings	30%	66%	0%	0%	4%
4. I know more how to get along with my children	22%	50%	0%	0%	28%
5. I know more how to discipline my children	14%	54%	4%	0%	28%
6. I communicate better with my family	14%	78%	2%	0%	6%
7. My relationship with family has improved	12%	66%	6%	0%	16%
8. I communicate better with my colleagues	8%	70%	10%	0%	12%
9. My relationship with colleagues has improved	6%	66%	10%	0%	18%
10. I know how to get along better with younger colleagues	22%	66%	6%	0%	6%
11. I believe that I can build up a healthy interpersonal relationship	20%	74%	4%	0%	2%
12. I am more willing to help others	20%	74%	4%	0%	2%
13. I am more willing to share with others and to seek help from others	18%	70%	6%	0%	6%
14. I hope to have a more positive and meaningful life	24%	74%	0%	0%	2%
15. I am more aware of the harmful effects of psychoactive substances	42%	42%	8%	0%	8%
16. I know more how to recognize psychoactive substance use or other addiction problems	28%	52%	18%	0%	2%
17. I know more how to deal with people who use or are addicted to psychoactive substances	10%	50%	26%	0%	14%
18. I feel that PAP has increased my recognition towards my identity as a firefighter	24%	58%	12%	0%	6%
19. I feel that PAP is helpful to firefighting job	10%	64%	20%	0%	6%
20. I feel that PAP has made me more devoted to my firefighting job	8%	48%	20%	2%	22%
21. I feel that PAP can help build up a positive image of the Hong Kong Fire Services Department	40%	52%	6%	0%	2%
22. I think that my spare time is sufficient to meet the requirements of PAP	14%	60%	22%	4%	0%
23. I am satisfied with the PAP	36%	64%	0%	0%	0%
24. I agree that a PAP2 or related activities should be developed in the future	58%	42%	0%	0%	-
25. I am willing to continue to be a mentor/volunteer if PAP2 is held in the future	46%	54%	0%	0%	-
26. I will invite my colleagues to be a mentor/volunteer if PAP2 is held in the future.	40%	56%	2%	2%	-

Figure 1. Comparison of the ROC curves of 2000/01 and the current study.



Diagonal segments are produced by ties.

Area Under the ROC

Model	Area	Std. Error ^a	Asymptotic Sig. ^b	Asymptotic 95% Confidence	
				Lower Bound	Upper Bound
Current Study	0.880	0.018	0.000	0.845	0.916
2000/01 Study	0.854	0.021	0.000	0.814	0.895

a. Under the nonparametric assumption

b. Null hypothesis: true area = 0.5

H_0 : Difference between areas = 0 vs. H_1 : Difference between areas > 0.

Difference	Asymptotic 95% Confidence		Std. Error	Z	p-value
	Lower Bound	Upper Bound			
0.026	0.008	0.044	0.009	2.905	0.007

Appendix I. Model of at risk psychoactive substance use in the 2000/01 study.

Model determining whether a student had ever taken or intended to take psychoactive substances from 2000/01 study

Risk Factor	OR _U	OR _M
Odds Ratio when all factors are equal to reference	-	1.555
Age		
10 or below (Ref.)		
11	0.292***	0.443*
12	0.509**	0.839
13	0.746	0.847
14	0.898	0.774
15	1.003	0.719
16	1.087	0.727
17	1.037	0.735
18	0.927	0.708
19 or above	0.953	0.740
Type of living quarters		
Public housing estates (Ref.)		
Housing Authority Home Ownership estates	0.917**	0.945
Private housing	0.987	0.956
Temporary housing	2.263***	1.532***
Others	1.017	0.836
Current use of alcohol		
No (Ref.)		
Yes	3.287***	1.233***
Current use of tobacco		
No (Ref.)		
Yes	7.241***	1.930***
Has friends/classmates who take psychoactive substances		
No (Ref.)		
Yes	7.577***	1.578***
Has family members who take psychoactive substances		
No (Ref.)		
Yes	3.823***	1.511***

Risk Factor	OR _U	OR _M
Degree of approval of people who take psychoactive substances regularly for non-medical use		
Strongly approve (Ref.)		
Approve	1.318***	1.225**
Disapprove	0.161***	0.432***
Strongly disapprove	0.047***	0.249***
Degree of approval of people who occasionally take psychoactive substances for non-medical use		
Strongly approve (Ref.)		
Approve	2.043***	0.831*
Disapprove	0.336***	0.645***
Strongly disapprove	0.077***	0.525***
Degree of accessibility to psychoactive substances		
Don't know (Ref.)		
Very difficult	8.033***	3.256***
Difficult	8.178***	3.451***
Easy	9.154***	3.524***
Very easy	15.467***	3.766***
<u>Perceived harm</u>		
“Psychoactive substance abuse destroys your future”		
Agree (Ref.)		
Disagree	2.744***	1.530***
“The current publicity strategies for the prevention of psychoactive substance use are effective”		
Agree (Ref.)		
Disagree	1.300***	1.046
“Young people should try different things”		
Agree (Ref.)		
Disagree	0.242***	0.683***
“I can control my consumption of psychoactive substances to avoid becoming addicted”		
Agree (Ref.)		
Disagree	0.265***	0.868***
“I do not mind getting along with those who are abusing substances”		
Agree (Ref.)		
Disagree	0.221***	0.705***

Risk Factor	OR _U	OR _M
“Nowadays, taking pills and cannabis is a hobby, just like smoking” Agree (Ref.) Disagree	0.201***	0.761***
"Taking Ecstasy / K is harmful to health" Agree (Ref.) Disagree	2.136***	1.475***
"I can control my habit of taking Ecstasy / K to avoid becoming addicted to Ecstasy / K" Agree (Ref.) Disagree	0.212***	0.702***
Bullied by classmates/schoolmates No (Ref.) Yes	1.459***	1.153***
Involved in triad society No (Ref.) Yes	6.369***	1.159***
Playing truant No (Ref.) Yes	3.286***	1.085*
Did not experience any problems in the past 6 months No (Ref.) Yes	0.404***	0.792***
Influenced by peers Rarely (Ref.) Not quite Sometimes Quite Very much	0.908** 0.798*** 1.088** 2.068***	0.928 0.916* 1.056 1.113*
Parents alive or deceased Parents are still alive (Ref.) Either father or mother was deceased Both parents were deceased	2.558*** 6.820***	1.356*** 1.690***

Risk Factor	OR _U	OR _M
Living with parents		
Both parents are living with the child (Ref.)		
Only father or mother is living with the child	1.966***	1.154***
Both parents are not living with the child	3.206***	1.346***
Parents don't understand their children		
Very similar (Ref.)		
Somewhat similar	0.468***	0.940
Somewhat dissimilar	0.366***	0.830***
Very dissimilar	0.340***	0.797***
Parents don't want to listen to their children's problems		
Very similar (Ref.)		
Somewhat similar	0.515***	0.853***
Somewhat dissimilar	0.377***	0.773***
Very dissimilar	0.291***	0.760***
Parents value their children very much		
Very similar (Ref.)		
Somewhat similar	1.152***	1.020
Somewhat dissimilar	1.769***	1.139***
Very dissimilar	2.369***	1.050
Parents don't like the way their children behave		
Very similar (Ref.)		
Somewhat similar	0.730***	0.827***
Somewhat dissimilar	0.992	0.905*
Very dissimilar	1.626***	0.946

* p<0.05; ** p<0.01; *** p<0.001

Appendix II. List of questions asked in the SPSI validation study.

1. Age
2. Type of living quarters
3. Sensation seeking
 - 3.1 I would like to explore strange places
 - 3.2 I like to do frightening things
 - 3.3 I like new and exciting experiences even if I have to break the rules
 - 3.4 I prefer friends who are exciting and unpredictable
 - 3.5 How often do you do dangerous things for fun?
 - 3.6 How often do you do exciting things even if they are dangerous?
4. Did you drink any alcoholic beverages in the last 30 days?
5. Did you smoke any tobacco products in the last 30 days?
6. Have you ever experienced the following problems in the past 6 months?
 - 6.1 Being bullied by schoolmates / classmates
 - 6.2 Involved in triad society.
 - 6.3 Reprimanded by school
 - 6.4 Too much pressure from school work
 - 6.5 Being blamed by teachers / parents due to undesirable academic performance
 - 6.6 Playing truant
 - 6.7 Always roaming around at night
 - 6.8 Your parents have physically punished you
 - 6.9 You have had physical injury caused by your parent's physical punishment
7. Do you personally know anyone who often takes psychoactive substances for non-medical use?
8. Do you approve or disapprove of people who take psychoactive substances for non-medical use occasionally?
9. Do you approve or disapprove of people who take psychoactive substances for non-medical use regularly?
10. Have you ever taken any of the psychoactive substances in List A?
11. How likely will you take any of the psychoactive substances in List A in the coming 1 year?
12. How easy do you think it would be for you to get psychoactive substances if you wanted some?
13. How much do you agree with each of the following statements?
 - 13.1 Taking psychoactive substances is harmful to health
 - 13.2 Psychoactive substance abuse destroys your future
 - 13.3 The current publicity strategies for the prevention of psychoactive substance use are effective
 - 13.4 Young people should try different things
 - 13.5 I do not mind getting along with those who are abusing psychoactive substances
 - 13.6 Nowadays, taking psychoactive substances is a hobby, just like smoking
 - 13.7 I can control my consumption of psychoactive substances to avoid becoming addicted
14. Cues to action items
 - 14.1 I can easily contact psychoactive substance users
 - 14.2 I always go to places where people take psychoactive substances
 - 14.3 I know where I can get psychoactive substances
15. Severity items
 - 15.1 Taking psychoactive substances has serious effects on our appearance
 - 15.2 Taking psychoactive substances has serious effects on our intelligence

- 15.3 I will likely be arrested if I take psychoactive substances
- 16. Perceived benefits items
 - 16.1 Taking psychoactive substances makes me happy
 - 16.2 Taking psychoactive substances releases my pressure
 - 16.3 Taking psychoactive substances makes me and my friends closer
 - 16.4 I can get rid of unhappy feelings when taking psychoactive substances
- 17. Perceived barriers item
 - 17.1 Psychoactive substances are expensive. It is difficult to earn money to buy them.
- 18. Perceived behavioral control items
 - 18.1 I can easily take psychoactive substances if I want
 - 18.2 If I take psychoactive substances, I can stop it any time
 - 18.3 If I take psychoactive substances, I can control the frequency and quantity
 - 18.4 I think stopping to take psychoactive substances is easy
- 19. Subjective norm item
 - 19.1 My friends will disapprove of me taking psychoactive substances
- 20. In your daily life, how often are you influenced by your peers?
- 21. Are your parents alive?
 - 21.1 My parents are still alive
 - 21.2 My father was deceased
 - 21.3 My mother was deceased
 - 21.4 Both my father and mother were deceased
- 22. Are your parents living with you?
 - 22.1 Both my father and mother are living with me
 - 22.2 Both my father and mother are not living with me
 - 22.3 My father is not living with me
 - 22.4 My mother is not living with me
- 23. To what extent do the following statements fit your relationship with your parents?
 - 23.1 Some teenagers have parents who don't really understand them
 - 23.2 Some teenagers have parents who are not willing to listen to their children's problems
 - 23.3 Some teenagers have parents who value their children very much
 - 23.4 Some teenagers have parents who like them the way they are
- 24. Family conflict items
 - 24.1 My family members always argue
 - 24.2 My family members rarely show anger
 - 24.3 Sometimes my family members throw things when they are angry
 - 24.4 My family members rarely lose their temper
 - 24.5 My family members always blame and criticize each other
 - 24.6 My family members sometimes fight against each other
 - 24.7 When my family members have different opinions about something, they avoid the matter so as to keep a peaceful environment
 - 24.8 My family members always want to win against each other
 - 24.9 My family members sometimes argue loudly when they have conflicts
- 25. Academic aspiration items
 - 25.1 I am interested in attending school
 - 25.2 I am willing to work hard in order to get more education
 - 25.3 One of my most important goals is to get more education
 - 25.4 I would put effort into my study if it would lead to a good job
- 26. Depression items
 - 26.1 I couldn't seem to experience any positive feeling at all

- 26.2 I found it difficult to take the initiative to do things
- 26.3 I felt that I had nothing to look forward to
- 26.4 I felt down-hearted and blue
- 26.5 I was not enthusiastic about anything
- 26.6 I felt I wasn't worth much as a person
- 26.7 I felt that my life was meaningless

Appendix III. Measures used in the SPSI validation study.

Variables based on The 2000/01 screening instrument. The 2000/01 screening instrument contains 28 variables which include 1) socio-demographic factors; 2) exposure to the risk of substance use; 3) attitudes towards psychoactive substances; 4) school and behavioral problems; and 5) family problems.

Family conflict

Family conflict was measured by the 9-item Conflict subscale of the Family Environment Scale (Moos & Moos, 1981). It has been used in the Chinese population (Ma & Leung, 1990). Items are scored on a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree, with higher score indicating higher level of family conflict.

Academic aspiration

Academic aspiration was measured by the 4-item Educational Aspiration Scale (Rich & Delgado, 2010). Items are scored on a 4-point Likert scale ranging from 1=strongly disagree to 4=strongly agree, with higher score indicating higher level of academic aspiration.

Sensation seeking

Sensation seeking was measured by the 4-item Brief Sensation Seeking Scale-4 (BSSS-4) and the 2-item Sensation Seeking Index (SS2) (Stephenson, Hoyle, Palmgreen, & Slater, 2003). For the BSSS-4, items are rated on a 5-point Likert Scale ranging from 1=strong disagree to 5=strongly agree, with higher score indicating higher level of sensation seeking. For the SS2, items are rated on a 5-point Likert Scale ranging from 1=never to 5=always, with higher score indicating higher level of sensation seeking.

Depression

Depression was measured by the 7-item Depression subscale of the Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998; Lovibond & Lovibond, 1995). It has been validated in Chinese (Taouk, Lovibond, & Laube, 2001). Participants rated their level of depressive symptoms according to the past 7 days on a 4-point rating scale from 0 (does not apply to me) to 3 (applies to me very much), with higher score indicating higher level of depression.

Cognitions related to psychoactive drug use.

Cognitions related to psychoactive drug use were measured by self-constructed items. It includes: 3 items on *cues to action* (e.g. "I know where I can get psychoactive substances"), 3 items on *perceived severity of psychoactive substance use* (e.g. "Taking psychoactive has serious effects on your intelligence"), 4 items on *perceived benefits of psychoactive substance use* (e.g. "taking psychoactive substances makes me happy"), 1 item on *perceived barriers of psychoactive substance use* ("Psychoactive substances are expensive. It is difficult to earn money to buy them"), 4 items on *perceived behavioral control* (e.g. "If I take psychoactive substances, I can stop any time"), and 1 item on *subjective norm* ("my friends will disapprove me to take psychoactive substances"). Items are rated on a 4-point Likert Scale from 1=strongly disagree to 4=strongly agree.

Appendix IV. Statistical procedures for constructing the SPSI.

Transforming the logistic regression model into a screening score

The logistic regression equal is expressed in the following equation:

$$\text{Log} (P/1-P) = \alpha + \beta_1 X_1 + \dots + \beta_r X_r \dots\dots\dots (1)$$

Where P = probability of being a self-reported psychoactive substance user or a user who has the intention to take psychoactive substances.

Equation (1) can be transformed into: $P = 1 / (1 + \exp (-(\alpha + \beta_1 X_1 + \dots + \beta_r X_r)))$

Since P is the probability of having either the experience or intention of using psychoactive substance, it can be used as a screening score – a higher score represents a higher risk for substance use.

Determination of the cut-off point and sensitivity/specificity

Those with the SPSI (P) Score above the cut-off point are at high risk of having the experience or intention to use substance, and vice versa. With the cut-off point determined, the following table can be derived and the sensitivity and specificity can be derived.

		Experienced user or intent user	
		Yes	No
SPSI screening status	SPSI positive	a	b
	SPSI negative	c	d

Sensitivity = $a / (a + c)$;

Specificity = $d / (b + d)$;

Sensitivity and specificity are epidemiological measure of screening performance (ranging from 0 to 1.0). Sensitivity is the proportion of experienced users or intent users being correctly screened positive and specificity is the proportion of non-users being correctly screened negative. Each potential cut-off point will give a pair of sensitivity and specificity – the specific cut-off point that gives an optimal pair of sensitivity/specificity will be used as the final cut-off point of the SPSI.

Appendix V. Measures for the quantitative outcome evaluation.

Cognitions related to psychoactive substances

1. Subjective norm for using psychoactive substances (outcome indicator 2). Subjective norm for using psychoactive substances was measured by 6 items constructed by McMillan and Conner (McMillan & Conner, 2003). Participants rated whether their significant others (e.g. friends, family members) agreed they should use psychoactive substances on a 7-point Likert scale ranging from 1=strongly disagree to 7=strongly agree, with higher score indicating higher level of subjective norm for using psychoactive substances. The Cronbach alpha of the scale was .96.
2. Subjective norm for not using psychoactive substances (outcome indicator 2). Five additional items were self-constructed to measure subjective norm at the two follow-up surveys. Sample items included “in the past 6 months, my friends/classmates have discussed with me about the negative effects of psychoactive substances”. Items were rated on a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree, with higher score indicating higher level of subjective norm. The Cronbach alpha of the scale was .84.
3. Perceived behavioral control (outcome indicator 3). Perceived behavioral control was measured by 6 items constructed by Norman and Conner (Norman & Conner, 2006). Participants rated their perceived level of control over psychoactive substance use on a 7-point Likert scale ranging from 1=strongly disagree to 7=strongly agree, with higher score indicating higher level of perceived behavioral control. The Cronbach alpha of the scale was .73. In addition, ten additional items were self-constructed to measure perceived behavioral control at the two follow-up surveys. Sample items included “I have the ability to refuse psychoactive substance use in the coming year”. Items were rated on a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree, with higher score indicating higher level of perceived behavioral control. The Cronbach alpha of the scale was .98.
4. Negative attitudes toward psychoactive substances. Negative attitudes toward psychoactive substances were measured by 19 items. Six items were adapted from the Attitude towards Substance Abuse subscale of the Beliefs and Attitudes of Substance Abuse Inventory (Fok & Tsang, 2005). The Chinese version of the scale is available and this scale is one of the outcome indicators proposed by the Beat Substances Fund for evaluation. It has also been used in the ACAN study. The Cronbach alpha of the scale was .78. The remaining items were self-constructed by the team and were measured at the two follow-up surveys. The Cronbach alpha of the scale was .71. All items were rated on a 4-point Likert scale ranging from 1=strongly disagree to 4=strongly agree, with higher score indicating more negative attitudes towards psychoactive substances.
5. Substance avoidance self-efficacy (outcome indicator 5). Substance avoidance self-efficacy was measured by the 16-item Substance Avoidance Self-efficacy Scale (Martin, et al., 1995). Participants were asked to imagine themselves in a particular situation and rate their level of confidence to resist substance use in that situation. Items were rated on a 7-point Likert scale from 1=definitely can't/ won't to 7=definitely can/ will, with higher score indicating higher level of substance avoidance self-efficacy. The Cronbach alpha of the scale was .94.

Personal growth

6. Self-esteem (outcome indicator 4). Self-esteem was measured by the 10-item Rosenberg Self-esteem Scale (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). It has been measured in Chinese. Participants rated their attitudes toward oneself on a 4-point Likert scale ranging from 1=strongly disagree to 4 = strongly agree, with higher score indicating higher level of self-esteem. The Cronbach alpha of the scale was .78.
7. Self-efficacy. Self-efficacy was measured by the 10-item Generalized Self-efficacy Scale (Schwarzer & Jerusalem, 1995). Items were rated on a 4-point Likert scale ranging from 1=not true at all to 4=true at all, with higher score indicating higher level of self control. It has been validated in Chinese (Zhang & Schwarzer, 1995). The Cronbach alpha of the scale was .92.
8. Self control. Self control was measured by the 16-item Self Control Scale (Grasmick, et al., 1993). Items were rated on a 5-point Likert Scale ranging from 1=definitely not applied to me to 5=definitely applied to me, with higher score indicating higher level of self control. It has been used in Chinese (屈智勇, 邹泓, & 段晓英, 2006). The Cronbach alpha of the scale was .61.
9. Life goals. Life goals were measured by the 5-item Chinese version of the Meaning in Life Questionnaire (Steger, et al., 2006). Items were rated on a 7-point Likert scale ranging from 1=strongly disagree to 7=strongly agree, with higher score indicating higher level of life goals. It has been measured in Chinese. The Cronbach alpha of the scale was .92.
10. Resilience. Resilience was measured by the 25-item of the Connor-Davidson Resilience Scale (Connor & Davidson, 2003). The scale assesses resilience, characteristics that promote successful coping with stress and adversity. It has been validated in Chinese (Yu, Lau, Mak, Zhang, & Lui, 2011). Items were rated on a 5-point Likert scale ranging from 1=never to 5=always, with higher score indicating higher level of resilience. The Cronbach alpha of the scale was .94.
11. Responsibility. Responsibility was measured by the 8-item Weinberger Adjustment Inventory – Responsibility (Weinberger & Schwartz, 1990). Items were rated on a 5-point Likert scale ranging from 1=definitely not applied to me to 5 =definitely applied to me, with higher score indicating higher level of responsibility. The Cronbach alpha of the scale was .68.

Aspirations

12. Academic aspiration. Academic aspiration was measured by the 7-item Hope subscale of the Academic Emotions Questionnaire (Pekrun, et al., 2002). It has been measured in Chinese (Ma, 2008). Items were rated on a 5-point Likert scale ranging from 1=definitely not applied to me to 5=definitely applied to me, with higher score indicating higher level of academic aspiration. The Cronbach alpha of the scale was .90.
13. Career aspiration. Career aspiration was measured by the 5-item Future Work Self (Strauss, et al., 2012). Participants were asked to imagine the future work self they hope

to become on a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree, with higher score indicating higher level of career aspiration. The Cronbach alpha of the scale was .93.

Family-related factors

14. Family function. Family function was measured by the 10-item Family Satisfaction Scale (Olson & Wilson, 1989). Items were rated on a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree, with higher score indicating better family function. The Cronbach alpha of the scale was .96.

Appendix VI. Subjective evaluation among the students.

Four evaluations were conducted after completion of the four core activities: mentorship (n=73), path-finding workshops (n=96), personal growth workshops (n=96), intensive training camp (n=96). In addition, one overall evaluation was conducted at the end of the PAP program (n=72). The students were asked to complete a self-administered, anonymous questionnaire in a classroom setting and they were informed that their participation was entirely voluntary and their answers would be kept confidential. The five questionnaires consisted of questions about students' views on the implementation of the activities, and their perceived efficacy of the core activities in improving their psychosocial health and cognition about psychoactive substance use.

1. Subjective evaluation of the mentorship program

參與《消防友師計劃》後： (歷奇和校本活動、Running men 暑期特務、水上活動)	十分同意 ✓✓	同意 ✓	不同意 ✗	十分不同意 ✗✗
1. 我感受到被友師支持和鼓勵。				
2. 我想學習友師積極正面的榜樣。 (如有理想、克服困難、樂於助人)。				
3. 友師有助我尋找理想和方向。				
4. 友師讓我發現自己更多的長處和能力。				
5. 友師讓我更有責任感。				
6. 我更願意與別人分享，尋求協助。				
7. 我更相信自己能建立健康的人際關係。				
8. 我對《消防友師計劃》的安排感到滿意。				

2. Subjective evaluation of the path-finding workshops

參與《友出路活動》令我： (個性測驗、參觀職業訓練學校、大學和公司)	十分同意 ✓✓	同意 ✓	不同意 ✗	十分不同意 ✗✗
1. 更了解自己的升學或職業取向。				
2. 更認識學業上有不同的出路(職業訓練學校、文憑課程及大學)。				
3. 更認識實際的工作環境。				
4. 覺得自己擁有不同的選擇和出路(學業、職業及其他)。				
5. 更能夠清晰訂立將來的目標和方向(學業、職業及其他)。				
6. 覺得自己將來是充滿希望的。				
7. 對《友出路活動》的安排感到滿意。				

3. Subjective evaluation of the personal growth workshops

參與《個人成長活動》，令我： (啟動禮、繩網歷奇活動、小組活動)	十分同意 ✓✓	同意 ✓	不同意 ✗	十分不同意 ✗✗
1. 感到被同學支持和接納。				
2. 感到被導師支持和接納。				
3. 知道自己在事件中的想法、感覺和行為，三者是互相影響的。				
4. 知道自己有時會有非理性的想法，如：放大負面事情及預計自己一定失敗。				
5. 覺得自己有能力改變自己的想法，如：正面及理性思考。				
6. 覺得自己有能力拒絕誘惑。				
7. 覺得自己有能力控制自己的情緒。				
8. 對《個人成長活動》的安排感到滿意。				

4. Subjective evaluation of the intensive training camp

參與四日三夜《創路雄心挑戰營》，令我：	十分同意 ✓✓	同意 ✓	不同意 ✗	十分不同意 ✗✗
1. 從消防人員身上學習到大無畏精神，如：團隊精神、為他人付出和堅持。				
2. 覺得對自己和他人都有一定責任。				
3. 覺得自己擁有「永不放棄，堅持到底」的精神，能達到目標。				
4. 覺得自己有能力面對日後各種的困難和挑戰。				
5. 對四日三夜《創路雄心挑戰營》的安排感到滿意。				

5. Overall subjective evaluation of the PAP

整體而言，參與《創路雄心計劃》後： (個人成長小組、歷奇活動、創路成長挑戰營、消防友師活動、家長工作坊、友出路)	十分同意 ✓✓	同意 ✓	不同意 ✗	十分不同意 ✗✗
Life goal 1. 我更明白即使考不上大學，也能有其他出路。 2. 我想爭取更好的成績。 3. 我更有興趣讀書。 4. 我開始考慮自己的將來。 5. 我對將來有更清晰的目標。 6. 我對將來更有希望。 7. 我更希望有一個積極和有意義的人生。				
Personal growth 8. 我發現到自己更多的長處。 9. 我加強了解決問題的能力。 10. 我更有信心克服困難。 11. 我更能夠堅持到底。				
Personal growth – Responsibility 12. 我更有責任感。 13. 我更自律。 14. 我更顧及別人的感受。				
Support from others 15. 我有一個作為我學習的榜樣。 16. 我有更多擁有積極生活態度的朋友。 17. 我感到朋友/友師關心我。 18. 我感到朋友/友師支持和鼓勵我。 19. 我感到朋友/友師欣賞和接納我。				
Family relationship 20. 我感到家人更明白我的需要。 21. 我感到家人更支持和鼓勵我。 22. 我感到家人更欣賞和接納我。 23. 我的家人覺得我有進步。 24. 我與家人溝通得更好。 25. 我和家人的關係得到改善。				
Substance-related cognitions 26. 我更明白毒品的禍害。 27. 我更清楚知道毒品是很容易上癮。 28. 我更清楚知道如何拒絕毒品。 29. 我更肯定將來不吸毒。				

整體而言，參與《創路雄心計劃》後： (個人成長小組、歷奇活動、創路成長挑戰營、消防友師活動、家長工作坊、友出路)	十分同意 ✓✓	同意 ✓	不同意 ✕	十分不同意 ✕✕
Participant satisfaction towards the program 30. 我對《創路雄心計劃》的安排感到滿意。				

Appendix VII. Subjective evaluation among the mentors.

The first evaluation on mentor trainings (n=94) was conducted in the last training session of mentor training workshop in October, 2013. The mentors were asked to complete a self-administered, anonymous questionnaire in a classroom setting. It consisted of 10 questions asking about their views on the efficacy of the workshops. The second evaluation was conducted between September and October 2013. The mentors filled out an online questionnaire (n=50), which consisted of 26 questions asking them about the perceived benefits of PAP. The participants of these evaluations were informed that their participation was voluntary and their answers were confidential.

1. Subjective evaluation of the mentor trainings

	十分同意 ✓✓	同意 ✓	不同意 ✕	十分不同意 ✕✕
1. 這工作坊能增加我對跨代關係、跨代貧窮及青少年正面發展的認識				
2. 這工作坊能讓我認識優質友師的素質，並且培養自己的素質				
3. 這工作坊能提高我對青少年濫藥問題的認識				
4. 這工作坊能提高我對青少年精神健康的認識				
5. 這工作坊能提升我對青少年的溝通技巧				
6. 這工作坊能推動我幫助青少年，並在有需要時懂得尋求協助				
7. 這工作坊能讓我明白「創路雄心」-友師計劃的具體運作				
8. 這工作坊能提高我對成為友師的信心				
9. 我能積極投入參與工作坊				
10. 總括來說，我對這工作坊感到滿意				

2. Subjective evaluation of the PAP

整體而言，你覺得自己參與了《創路雄心》後：	十分同意 ✓✓	同意 ✓	不同意 ✗	十分不同意 ✗✗	不適用
1. 我覺得《創路雄心》對學生（或友員）有幫助。					
2. 我發現自己更多的長處和能力。					
3. 我更會顧及別人的想法和感受。					
4. 我更懂得與子女相處。					
5. 我更懂得管教子女。					
6. 我與家人溝通得更好。					
7. 我和家人的關係得到改善。					
8. 我與同事溝通得更好。					
9. 我和同事的關係得到改善。					
10. 我更懂得與年輕的同事相處。					
11. 我更相信自己能建立健康的人際關係。					
12. 我更願意幫助別人。					
13. 我更願意與別人分享，尋求協助。					
14. 我更希望有一個積極和有意義的人生。					
15. 我更明白毒品的禍害。					
16. 我更懂得辨認吸毒或其他成癮問題。					
17. 我更懂得處理身邊的人吸毒或其他成癮問題。					
18. 我覺得《創路雄心》增加我對消防人員身份的認同感。					
19. 我覺得《創路雄心》對消防工作有幫助。					
20. 我覺得《創路雄心》讓我更投入消防工作。					
21. 我覺得《創路雄心》有助香港消防處建立正面形象。					
22. 我覺得公餘時間足以應付《創路雄心》的活動需要。					
23. 我對《創路雄心》的安排感到滿意。					
24. 我贊成繼續舉辦《創路雄心 2》或相關活動。					
25. 如果有《創路雄心 2》，我會願意繼續擔任消防友師/義工。					
26. 如果有《創路雄心 2》，我會邀請同事擔任消防友師/義工。					

Appendix VIII. Subjective evaluation conducted among the parents.

The evaluation was conducted at the second parent training workshop in January 2013 (n=43). Parents were informed that their participation was voluntary and their answers were confidential. Parents were asked to complete a self-administered, 26-item anonymous questionnaire at CUHK. The parents were asked whether the workshop had increased their understanding of particular topics regarding adolescent psychoactive substance use, Internet addiction, parenting, and their skills in dealing with their child(ren) if they were found to use psychoactive substances. Overall, views about the time, venue and content of the workshop were also explored.

	十分同意 ✓✓	同意 ✓	不同意 ×	十分不同意 ××
第一節「家長匯習-6A 父母學堂」講座令我： 1. 更明白親子教育的原則。 2. 更懂得在「愛」和「管教」中取得平衡。 3. 更懂得與孩子建立健康及親密關係。 4. 滿意講師表現。				
第二節「東華三院-不再迷『網』」講座令我： 5. 更認識青少年沉迷上網的情況及影响。 6. 更容易分辨我的子女有沒有沉迷上網。 7. 認識更多求助途徑，處理子女可能有的沉迷上網問題。 8. 更能夠積極面對子女的行為問題。 9. 更能夠處理自己的情緒問題及能力。 10. 滿意講師表現。				
第三節「東華三院越峰成長中心-『癮』」講座令我： 11. 更認識青少年最常濫用的藥物名稱、影响及吸食方法。 12. 更掌握如何預防我的子女濫藥。 13. 更容易分辨我的子女有沒有濫藥。 14. 認識更多求助途徑，處理子女可能有的濫藥問題。 15. 更明白青少年的特性及青少年潮流文化。 16. 更懂得與我的子女溝通。 17. 更懂得處理我與子女的衝突。 18. 更有效運用獎罰處理子女的行為。 19. 更能夠積極面對子女的行為問題。 20. 更能夠處理自己的情緒問題及能力。 21. 滿意講師表現。				

	十分同意 ✓✓	同意 ✓	不同意 ✕	十分不同意 ✕✕
講座舉辦形式方面： 22. 時間合適。 23. 地點合適。 24. 講座內容合適。				

Appendix IX. Qualitative feedback.

- 1 Teachers' perceptions of the effectiveness of the screening instrument in focus group interview, e.g.
 - 1.1 問卷選出黎既學生係比較需要認同和肯定，我覺得呢個 PROGRAM 喺做到
 - 1.2 問卷準確性都幾高，佢地屋企既問題同個人問題都顯示到
- 2 Students' feedback on path-finding journey in in-depth interviews, e.g.
 - 2.1 Promoted personal development, fostered teamwork and mentor support in student team building day, e.g.
 - 2.1.1 經過玩繩網，挑戰自己，令自己個膽大咗，冇以前咁驚青，乜都唔敢玩，宜家敢去嘗試...好有滿足感
 - 2.1.2 之前對朋友只喺拍下膊頭，宜家真喺會去幫朋友，互相合作，好似玩繩網咁
 - 2.1.3 以前我好畏高、唔敢玩公園(好高既設施)，有呀 SIR 係身邊鼓勵就唔驚...依家大膽咗，會玩機動遊戲
 - 2.2 Identified their interest and thought about their future, and were able to find possible paths in path-finding workshops, e.g.
 - 2.2.1 諗法唔同咗，以前會唔清楚自己做緊咩嘢，有咩目標...我知道自己鍾意寫作同科學嘅嘢，我諗第時可能做科學嘅嘢，又或者做編劇，作故仔之類...
 - 2.2.2 依家有(目標)，長遠想入大學，短期想成績好
 - 2.2.3 諗野長遠咗，以前諗想做嘅嘢會不設實際，宜家會跟番自己嘅能力，特別喺選擇工作方面，會多左其他嘅諗法，好似有一次去左參觀，令我想做髮型屋
 - 2.2.4 比同齡更加諗過將來，知道咗就算讀唔書，仲有青年學院...
 - 2.2.5 要先試過某 D 職業先知道自己啱唔啱自己...睇過(香港寬頻)先知道同自己諗嘅唔同...依家想試多 D 唔同嘅嘢...
 - 2.3 Thinking and sharing in personal growth groups, e.g.
 - 2.3.1 俾一張相出黎大家諗吓...會刺激到思維
 - 2.3.2 肯多 D 分享自己...以前都主要喺聽人哋分享...創路雄心有好多分享，好多時都叫我分享...初時都喺 D 標準答案，到之後都好真心分享，最後一次真係好真心咁分享...因為 0 個度 D 人可以信任...以前會諗 D 人係唔係陰我，會唔會講俾全世界聽，之後 D 人會唔鍾意我
 - 2.4 Developed substance refusal skills in personal growth groups, e.g.
 - 2.4.1 SAY NO 嘅方法嚟嚟去去都喺個 D...但創路雄心個方法好深刻...抽紙...諗咗好多好得意...好 SPECIAL 嘅場景...好記得...通識堂其實都有教，但創路雄心令我好深刻
- 3 Students' feedback on intensive training camp in in-depth interviews, e.g.
 - 3.1 Developed problem solving skills, resilience and enhanced self-esteem from fire services training, e.g.
 - 3.1.1 好似玩黑箱咁...喺咁撞黎撞去，原來條路喺唔通嘅...但係我哋 KEEP 住唔放棄先可以搵到條路...去面對困難嘅時候都唔好退縮住，先試多幾次，搵唔到辦法先搵人幫手...唔係成日話咁難架唔做啦，咁煩架唔做啦，其實做數學都係咁。

- 3.1.2 我(以前)覺得...總有一 D 逆境係面對唔到，消防學校就喺俾到個可以令你諗另一個解決方法嘅一個地方，例如抬 DUMMY 落山
- 3.1.3 我認為就算去咗一個 Day Camp，自己價值地會上升左，因為相對上經歷多咗，俾其他人知嘅嘢多咗...尤其去消防學校，真係好難得，所蘊含嘅價值更加高，都覺得自己價值高咗
- 3.2 Developed self-discipline, respect to others, politeness and responsibility in disciplinary training, e.g.
- 3.2.1 參加消防 Camp 認識咗真正嘅紀律部隊要行得正企得正...對我最大影響應該喺，當我想要破壞規矩嘅時候，一 d 我自己覺得無所謂嘅規矩嘅時候，會先停一停諗一諗
- 3.2.2 在營會中，訓練下自己對長輩嘅態度...唔好對 d 阿 Sir 咁寸囉...我以前好寸嫁...而家對人講野嘅態度有 d 進步...改變係因為係 Camp 度唔可以寸會俾人罰...出咗 Camp 就習慣咗...要識得尊重，以前覺得自己啱就唔需要理佢咗，而家就算覺得自己啱都會聽咗佢地講嘢先，少咗反駁
- 3.2.3 以前唔會同家人講早晨，宜家學識咗尊重人，對家人有禮貌咗，家人都會話我有改變，話我以前冇乜禮貌，宜家會欣賞我，但我又覺得可以做好 D
- 3.2.4 依家會唔同咗，反而想應佢（老師）YES!SIR!可能喺消防入面唔可以違反阿 SIR、MADAM。例如：CAMP 前未交工作紙，出 CAMP 後副校問及嚴厲地要求要交
- 3.2.5 盡返做仔嘅責任...盡返做學生嘅責任...依家要認真讀書...執房維持整齊
- 3.2.6 過咗成個消防學校，發現自己生活上面 time-management 都幾差，咁今年特登買咗一個新嘅 Time-schedule book，開始幫自己寫下 time table，睇下自己平時做 d 咩，或者約人個陣就唔會話事但啦到時先算
- 3.3 Promoted team work and acceptance to work with peers, e.g.
- 3.3.1 營會中步操/訓練，感受到團隊，大家需要一致腳步...人地得，我都得。而自己最後的確做到
- 3.3.2 我都覺得自己係比較堅持，面對逆境係比較強...（CAMP）原來我自己未去到極限...諗過幾次去放棄，有朋友既支持...其他同學都堅持到...所以堅持落
- 3.3.3 呢個問題一直好困擾我好耐...攞晒 D 嘢上身...跟住做得唔到會自責...（CAMP）做班長...攞左個責任，又要做得好，又要平衡，要學識調節
- 3.3.4 之前未接觸佢咗嗰陣會有 D 偏見...要放低偏見的心同佢咗相處，出黎做嘢都會喺咁...無我想像中咁嘈咁低 B
- 3.4 Overcome adversities and created a meaningful future as impressed by fire services training officer sharing, e.g.
- 3.4.1 我阿爸媽離咗婚，各自有自己嘅老公老婆，我記得 madam yu 同我生世好似，都好慘，我覺得佢比左一個好好嘅榜樣我，唔會自怨自艾，佢仲有病，要打針，但佢好勇敢，亦鼓勵咗我以後要改變自己弱處，至少佢對得住自己，仲做到消防嘅職位，引領我去一個好 D 嘅思想
- 3.4.2 （好似 madam yu 咁）嗰時無出現過「爸爸」，入咗 CAMP 覺得無嘢無可能，唔好埋怨人地、自己，學識堅持(例如：以前跑圈好勁)和加強專注力(例如：溫書比以前專注)」
- 3.5 Perceived family support in the graduation ceremony, e.g.
- 3.5.1 營會結業禮，感受到屋企人好支持，見到自己完成到好開心，之前都知，

但感受無咁大

- 4 Students' feedback on mentorship follow-up in in-depth interviews, e.g.
 - 4.1 Developed positive thinking, ability to deal with challenges, and altruism role model of mentors, e.g.
 - 4.1.1 消防人員參加呢個活動，對於我嚟講喺好大意義，因為佢哋全部嘅諗法都好正面，將我係一個比較負面嘅諗法，變得好咗好多。
 - 4.1.2 佢地又可以幫我諗方法解決問題，好似個攀爬活動，水上活動，佢地都會幫我，支持我。見到佢地會令我有奮鬥心，不怕勞苦
 - 4.1.3 可以帶比我地人生經驗，感情呀、事業呀，佢做過嘅當係我既經驗...我覺得成年人喺欺善怕惡、自私、貪慕虛榮，都令我知道唔係個個都咁自私，好似消防會救人，會令自己危險。
 - 4.2 Changed their perceptions toward adults after receiving care and support from the mentors, e.g.
 - 4.2.1 開頭覺得 D 大人唔會點理細路，但原來佢哋（消防員）都會關心我地，會問我做咩唔開心
 - 4.2.2 我想做老師？(友師問：中學定小學?)我話小學，友師個時真係寫低咗，我覺得好驚奇點解會寫低...知道唔係自己一個人做野，其實有一班人係後面鼓勵我
 - 4.2.3 (因為友師)少左埋怨 D 大人...會聽下佢地講咩先，會自己分析下...多左耐性，少左抱怨
 - 4.3 Showed positive perceptions of the program including experiential learning and activities which enabled participants to remember and analyze anti-substance use messages
 - 4.3.1 解釋會詳細 D...其他唔會講到 D 徵狀，之後又會點...咩方法咁
 - 4.3.2 (其他)聽得太多，麻木左...「創路雄心」深入左...又可能有 D 活動...睇返 D CASE...會深刻左
 - 4.3.3 比檢毒計劃...我唔記得佢講左 D 乜野...但創路雄心聽完要分析...個記野方法有趣
- 5 Parents' feedback in focus group, e.g.
 - 5.1 Promoted autonomy in parental workshop, e.g.
 - 5.1.1 我都係親子友師工作坊最深刻，以前小學 d 親子活動都係家長主導，驚訝而家 D 子女竟然係會好主動，分組，安排工作、計劃行程，個刻我先發現左原來子女已經識得 Planning，唔洗我地啦。由子女帶番自己行，無唸到原來佢地已經做得到...覺得幾好
 - 5.2 Students' changes and achievement in the intensive training camp, e.g.
 - 5.2.1 最深刻係係消防畢業禮，仔仔見攞住我喊，唔係話好辛苦，而係佢可以做得到...我都好開心，真係覺得佢大個仔啦
 - 5.2.2 我個仔返去 0 個兩三日都有摺被，別佢自己燙校服佢又願意，而家都會叫佢自己燙自己校服，直到而家
 - 5.3 Students motivated to find future directions, e.g.
 - 5.3.1 仔仔都大個左，開始識唸將來，佢參觀完 IVE 番黎同我分享如果真係無興趣讀上去，可以學下廚咁...佢而家中三，學校都要選科，佢又會唸下自己將來想做咩而去揀科，仲會上網搵資料...想做邊行，大學要讀 D 咩，要選 D 咩科...我都係好欣賞。我都覺得係透過呢個計劃，帶出佢地要諗

下將來，隨住目標去諗方法去行。

- 5.4 Positive role model and guidance provided by fire services mentors, e.g.
 - 5.4.1 消防員比其他職業/機構更正氣，其實機構可能係宣傳...捨己為人，政府部門裡面最 RESPECTFUL...又有 D 神祕感對孩子是特別的，不容易接觸
 - 5.4.2 MADAM WU 生命影響生命，佢都可以做到咁高職位，仔仔會覺得自己身體既限制都唔係好大件事。所以消防員生命影響生命，我都覺得幾有感覺
 - 5.4.3 有其他哥哥姐姐話俾佢地聽會幫助...唔係淨係得爸爸媽媽講...出 CAMP 後被 MADAM 話過有改善，依家雖然有 D 變返以前咁，但提返 MADAM 話過佢，都有反省，好過爸爸媽媽一直話佢個死穴

- 6 Mentors' feedback in focus group, e.g.
 - 6.1 Rapport building and support in mentorship follow-up activities, e.g.
 - 6.1.1 突破營...互相幫助既關係...同埋一定做得到
 - 6.1.2 真誠既分享...可以傾好多自己既路同分享，初初一個聽，然後好多人聽...佢又會講背後既野，家庭有幾複雜
 - 6.1.3 有個同學啱傾，好主動，可以分享到感情生活，返學環境，升唔到原校，依家做左兩份工...在轉接期...可以幫佢分析，其他野就等佢選擇...我只係做個引導，幫到唔係咁多...只係唔想佢行冤枉路
 - 6.2 Witness and support provided in the course of the intervention program, e.g.
 - 6.2.1 以前被阿媽迫讀書...有時間俾佢反思...寫低 D 目標...有一個有寫低有關讀書既目標
 - 6.2.2 有個自信好底...D 人推佢出黎...大膽左，講到...再下次自己主動行出黎
 - 6.2.3 畢業禮 0 個日...爆吠...我覺得好小事...佢好慌張，原來我地既存在已經係一個支持，小小既鼓勵性，好神奇
 - 6.2.4 好似 0 個晚去飲野，佢地叫我擺，我問得唔得...擺完之後，要罰...有好多自己行出去承認

- 7 Teachers' feedback in focus group interview, e.g.
 - 7.1 Positive peer group formed in the program, e.g.
 - 7.1.1 成個群體既影響力都幾好...群體裡面互相影響，都係比較正面...
 - 7.1.2 抽離左唔好咁好既朋友，成日對住創路雄心的同學，次數唔少...有一兩個 CASE 完全脫離左以前既同學...
 - 7.1.3 學生會覺得老師係想佢地有改變...但佢地睇到消防員係義工，佢地會欣賞，點解要幫我地...
 - 7.2 Personal growth of students e.g.
 - 7.2.1 學生被肯定，無論幾位和消防員，佢地能夠做好...無論學習態度...或者做野正面左
 - 7.2.2 學生主要係注意力缺乏 D、自信低 D...進步多左...對自己信心大左，大膽左，會出聲，會客氣...唔係埋怨...唔係扭計
 - 7.3 Parents change in the program, e.g.
 - 7.3.1 家長需要呢 D 活動...家長著重成績，但學生能力係低...家長吹局得好緊要，好多爭執，令學生唔想返學...家長好像睇通 D 野，適當地放手同鼓勵

Appendix X. Materials collected in intervention.

1. Recording feelings in a log book during the intensive training camp at the Fire Services training school

第一天	第二天	第三天	第四天
<p>我最深刻的片段</p> <p>因為食完飯之後收 若唔好...所以 比人俾做等上屋 好奇怪!:</p>	<p>我最深刻的片段</p> <p>65人 檢閱呀 候、聽呀 Sir 清楚地在在一起 錄</p>	<p>我最深刻的片段</p> <p>教官對我地負指 告白,好感動 上堂 唔唔唔</p>	<p>我最深刻的片段</p> <p>見番之前去 繩網咽D 呀 Sir</p>
<p>我的心情</p> <p>男媧,無聊</p>	<p>我的心情</p> <p>期待</p>	<p>我的心情</p> <p>開心</p>	<p>我的心情</p> <p>非常 happy</p>

第一天	第二天	第三天	第四天
<p>我的發現</p> <p>目標</p>	<p>我的發現</p> <p>唔亂 唔皮氣</p>	<p>我的發現</p> <p>努力</p>	<p>我的發現</p> <p>加油</p>
<p>我最欣賞的人/事</p> <p>有</p>	<p>我最欣賞的人/事</p> <p>有</p>	<p>我最欣賞的人/事</p> <p>有 team work</p>	<p>我最欣賞的人/事</p> <p>堅持 是 王道</p>

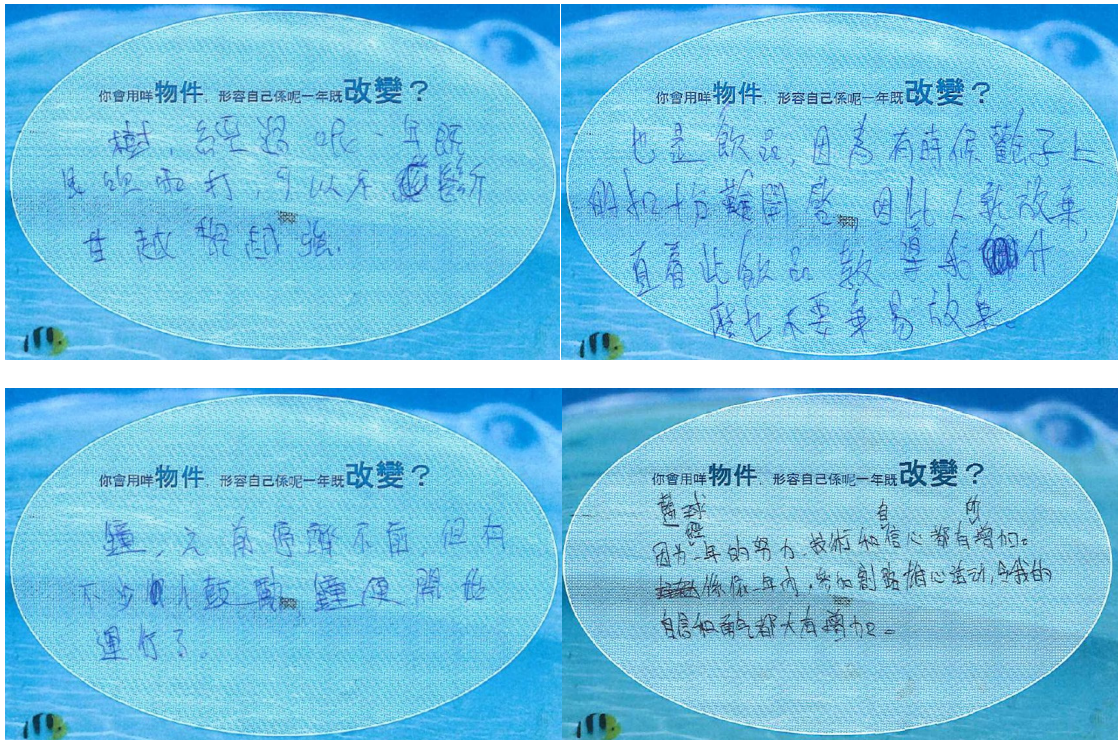
日期：19. 3. 2023 第一天

<p>我最深刻的片段</p> <p>在街上 下車</p>	<p>我的心情</p> <p>不適應 → 有期待，覺得 社會好美好好 開開心</p>
<p>我的發現</p> <p>我累了 → 比大人累，我以為 我不懂一切回家， 但我學不來了!</p>	<p>我最欣賞的人/事</p> <p>養父 → 好男人，比媽媽 為我們做更多 東西</p>

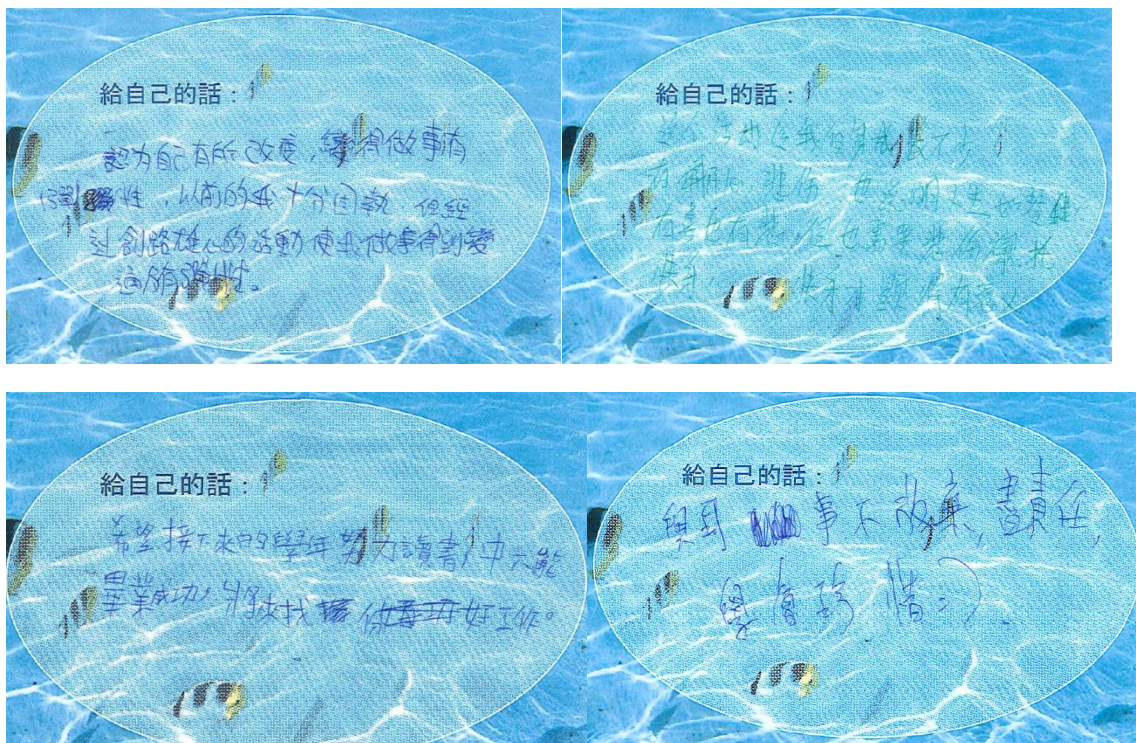
日期：22. 3. 2023 第四天（最後一天）

<p>我最深刻的片段</p> <p>→ 畢業禮 → 大家最後 一直最後一 刻的舉動， 這一刻</p>	<p>我的心情</p> <p>→ 興奮 說不盡</p>
<p>我的發現</p> <p>→ 大家的決心 好偉大，感 謝你在這，幫 著我在這</p>	<p>我最欣賞的人/事</p> <p>身體不舒服， 但你堅持到最 後</p>

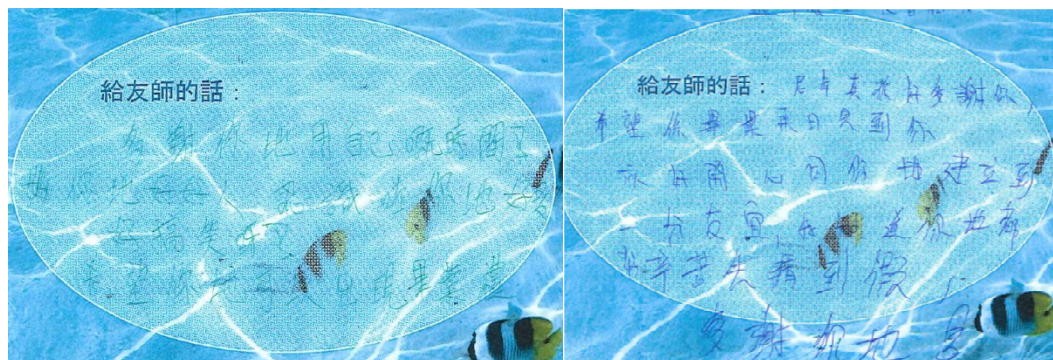
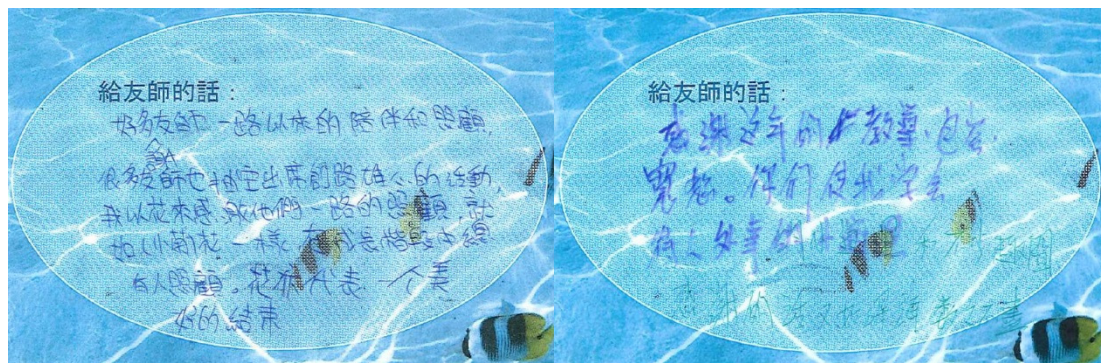
Changes throughout the program



Word to self



Word to mentors



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