

# **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)**

## **Executive Summary**

### **Introduction**

Adolescent substance abuse is a major global health issue. In Hong Kong, the prevalence of ever use of psychoactive substances among secondary school student was 2.2% in 2011/12 (Narcotics Division, 2012). Substance use among adolescents is associated with various physical and psychological harms, including increased risks 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).

Drug use among students is a highly complex social and health problem. Intensive and interdisciplinary approaches are required for development of effective drug prevention interventions. To date, most of the local drug use prevention programs incline toward primary intervention in nature. There is a dearth of evidence-based and well evaluated local secondary interventions which target high risk individuals. Integrated screening and intervention secondary prevention packages have found to be effective in curtailing this problem. 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).

Development of a culturally specific screening instrument to identify students who are at risk of substance use is a prerequisite for conducting secondary interventions and is highly warranted. A screening tool, the Secondary Prevention Screening Index (SPSI) was hence developed by the research team in the PAP. It was built upon information obtained from a previous large scale student survey (Narcotics Division, 2000) together with additional information, which covered comprehensive domains such as smoking, alcohol use, living arrangement with parents, family conflict, sensation seeking, depression, academic aspirations and perceived benefits of psychoactive substance use, but not questions asking directly about substance use behaviors and intention, hence minimizing labeling effect. A validation study was conducted in 10 secondary schools in the Shatin and Tai Po districts, and the results have found to be satisfactory.

Effective intervention programs should include a number of elements, including 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). These elements had all been used in designing our Path-finding Project (PAP). The PAP screened secondary school students at high risk of substance 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. It was also based on

behavioral health theories and involved a control group. One important feature of the PAP was involvement of fire services personnel serving as mentors, as well as teachers and parents.

## **Objectives**

1. 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.
2. To test further performance of the screening instrument in predicting current use of psychoactive substance among adolescents.
3. 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.

## **Methods**

### ***Development and validation of the SPSI for identification of secondary school students who are at risk of substance use***

A study was conducted to build up the SPSI. It surveyed 7,456 secondary school students in 10 secondary schools in Shatin, Tai Wai, Fan Ling, Yuen Long, Tin Shui Wai and Tung Chung during April to June, 2012. It contained 28 variables that were found to be predictors of substance use behaviors and intention among secondary school students in the ACAN 2000/01 student survey (Narcotics Division, 2000), and 11 potential additional factors based on literature review. Using statistical methods, a risk score indicating the level of risk for psychoactive substance use (i.e. ever use of psychoactive substances or intention to use such substances in the future) was generated for each student. In addition, a separate case-control study was implemented to test the ability of the SPSI in distinguishing 50 adolescents who were known psychoactive substance users (the case group) from 50 adolescents who were non-psychoactive substance users (the control group).

### ***Screening at risk students using the SPSI***

A screening survey was conducted among 1,692 students of seven secondary schools (four schools joined the intervention group and three schools joined the control group) in the Shatin and Tai Po districts from September 2013 to October 2013.

### ***Quantitative evaluation of the intervention program***

A survey was conducted among 154 students joining the intervention group and 124 students whom were screened positive by the SPSI in the control group from October 2013 to November 2013 (T0) to provide baseline data for evaluation. Two follow-up surveys were conducted at completion of the intervention (post-intervention) (T1), and at three months after completion of the intervention (T2).

### ***Subjective evaluation of PAP components***

Subjective 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 the students of the intervention group; two were completed by mentors; one was completed by students' parents.

### ***Qualitative evaluation of outcomes***

Sixteen students of the intervention group, four from each of the four schools, were in-depth interviewed. In addition, six parents (from four schools), nine mentors and four teachers (from four schools) of the intervention group participated in three focus group discussion sessions.

### ***Development of the PAP***

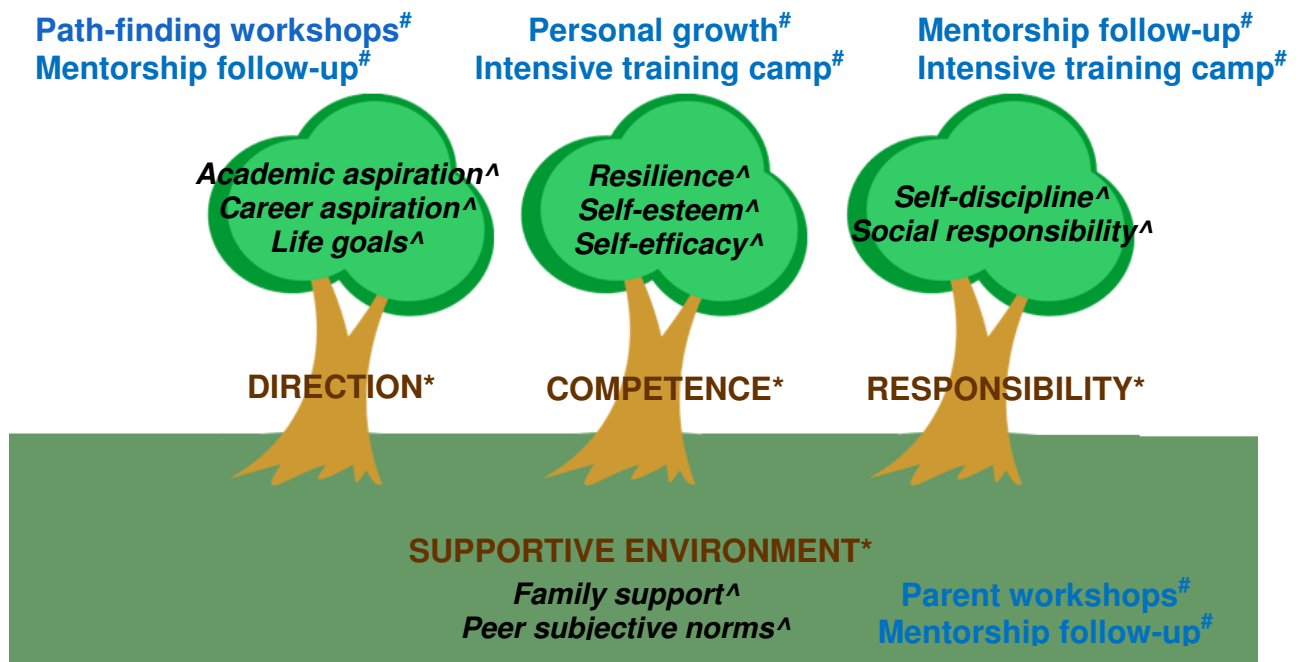
The social marketing approach (Lee & Kotler, 2011) was employed to develop the PAP. The PAP was developed based on the Social Cognitive Theory (SCT), attempting to improve the family and school environments of the at-risk students, and expose participating students to mentorship (role models) in order to induce positive observational learning. As fire services personnel are greatly admired by many students and parents for their altruism, courage, discipline and resilience, they were invited to serve as mentors of PAP; mentorship was a core component of the PAP. Parents were also invited to join the program's activities. The Theory of Planned Behavior was also used to build up intervention components dealing with attitudes, subjective norm and behavioral control related to substance use.

In addition, various types of stakeholders were involved in the development of the PAP, including 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.

### ***Conceptual framework***

The PAP attempted to prevent substance use by enhancement of four domains of protective factors: 1) identification of future directions, 2) development of a sense of competence, 3) development of a sense of self-discipline and responsibility, and 4) creation of supportive environments. A set of specific aims was developed under each of these four domains (see Figure 1). The PAP intervention consisted of five major types of events (personal growth workshops, path-finding workshops, parent workshops, intensive training camp, and mentorship), under each of which a number of specific activities were held. Students, parents and mentors were involved in these activities

**Figure 1. Domains, aims and core events of PAP.**



\* refers to domains;

^ refers to aims;

# refers to core event types

## Results

### *Development and validation of SPSI among secondary school students*

Two out of the 11 newly added variables (perceived benefits of psychoactive substances and academic aspirations) plus the 28 initially considered variables derived from the ACAN 2000/01 student survey (Narcotics Division, 2000) were found to be statistically significant in the logistic regression models. The SPSI hence consisted of 30 variables. It did not ask about substance use behavior and intention. The specificity and sensitivity of the SPSI were 85.1% (95% confidence interval = 84.0%, 86.2%) and 75.0% (95% confidence interval = 73.6% , 76.4%), respectively. The sensitivity, specificity, and accuracy of the revised SPSI when applied to distinguish between current psychoactive substance users and non-users were 93.8%, 85.4%, and 89.6% respectively. Its performance is hence satisfactory.

### *Implementation of screening and secondary intervention activities*

A total of 124(24.5%) and 188 (15.8%) students of the control group and the intervention group were screened positive by using the SPSI, respectively. A total of 154 students, including positively screened students and those recommended by teachers, participated in the 6-month intervention 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.

## ***Results of quantitative evaluation***

### *Between-group comparisons*

At completion of the PAP intervention (T1), 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), and 5) higher score on *self-esteem*, 6) higher *resilience*, and 7) higher *academic aspiration*.

At three-month after completion of the intervention (T2), 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.

### *Within-group comparisons*

In the intervention group, analysis comparing T1 versus baseline data (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) *improvement in 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.

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*.

In the control group, significant within-group changes were only observed in variables of perceived behavioral control (the Norman and Conner Scale) and life goals. Significant improvements were common within the intervention but not within the control group.

### ***Subjective evaluation of the PAP components***

The majority of the students were satisfied with the core activities (100% for mentorship; 81.7% for path-finding workshops; 92.7% for personal growth workshops; 94.8% for the intensive training camp). All students reported that they were satisfied with the PAP. Almost all parents agreed that the workshop has increased their understandings on the principles of parenting (98% to 100%), adolescent psychoactive substance use (93% to 100%), and ways to deal with their own emotional problems (100%). Almost all mentors (98%) were satisfied with the mentorship training and the mentorship experience. All agreed that similar interventions should be developed in the future.

### ***Results of qualitative evaluation***

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.

### **Discussion and recommendations**

The PAP has hence 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 secondary intervention activities, in collaboration with the Fire Services Department and many stakeholders including teachers, parents and community workers. Results show that the PAP has increased high risk students' self-esteem, resilience, self-efficacy, academic and aspiration, family function, and cognitions about substance use. In addition, the PAP was beneficial to the participating parents and mentors.

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 multiple types of stakeholders. We propose some specific recommendations that were made basing on our findings.

1. We strongly recommend continuation and scaling up of the promising PAP in the future. The PAP experience shows that it is feasible to run secondary substance prevention programs within the school setting; school principals, mentors and parents taking part in the PAP all welcome and are looking forward to witnessing its continuation.

The existing arrangement of the Smart Teens program of the Education Bureau offers an excellent opportunity for integration by addition of some PAP components (such as SPSI screening, pre-camp induction, parental involvement, mentorship, school-based follow-up workshops and outbound visits). Our research team has discussed about 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 about the opportunity with the Permanent Secretary for Education, Mrs Cherry Tse, who has written to us that she supports the integration proposal in principle.

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 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 building up positive protective factors, including those deeper ones that are related to personal growth and family communication.

## 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. 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.

## References

- Barkus, E., & Murray, R. M. (2010). Substance Use in Adolescence and Psychosis: Clarifying the Relationship. *Annual Review of Clinical Psychology*, 6(1), 365-389. doi: doi:10.1146/annurev.clinpsy.121208.131220
- Elliott, L., Orr, L., Watson, L., & Jackson, A. (2005). Secondary prevention interventions for young drug users: a systematic review of the evidence. *Adolescence*, 40(157), 1-22.
- Hanson, K. L., Medina, K. L., Padula, C. B., Tapert, S. F., & Brown, S. A. (2011). Impact of Adolescent Alcohol and Drug Use on Neuropsychological Functioning in Young Adulthood: 10-Year Outcomes. *Journal of Child and Adolescent Substance Abuse*, 20(2), 135-154.
- Huang, D. Y. C., Lanza, H. I., & Anglin, M. D. (2013). Association between adolescent substance use and obesity in young adulthood: A group-based dual trajectory analysis. *Addictive Behaviors*, 38(11), 2653-2660. doi: <http://dx.doi.org/10.1016/j.addbeh.2013.06.024>
- Lee, N. R., & Kotler, P. (2011). *Social marketing: Influencing behaviors for good (4th edition)*. Thousand Oaks, California: Sage Publications.
- Mak, S. K., Chan, M. T. Y., Bower, W. F., Yip, S. K. H., Hou, S. S. M., Wu, B. B. B., et al. (2011). Lower Urinary Tract Changes in Young Adults Using Ketamine. *The Journal of Urology*, 186(2), 610-614. doi: <http://dx.doi.org/10.1016/j.juro.2011.03.108>
- Narcotics Division. (2000). The report of 2000 Survey of Drug Use among Students. HKSAR: Security Bureau.
- Narcotics Division. (2012). The 2011/12 Survey of Drug Use among Students: Narcotics Division, HKSAR
- Nation, M., Crusto, C., Wandersman, A., Kumpfer, K. L., Seybolt, D., Morrissey-Kane, E., et al. (2003). What works in prevention. Principles of effective prevention programs. *American Psychologist*, 58(6-7), 449-456.
- Patton, G. C., Coffey, C., Carlin, J. B., Degenhardt, L., Lynskey, M., & Hall, W. (2002). Cannabis use and mental health in young people: cohort study. *BMJ*, 325(7374), 1195-1198. doi: 10.1136/bmj.325.7374.1195