Prevention for depressive symptoms among adolescents in Hong Kong: A study of enhancing subjective well-being

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Submitted in part fulfillment for the
Postgraduate Diploma in Psychology

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Date: 11 August 2008

Acknowledgements

This research project would not have been possible without supports of my supervisor, colleagues and friends. This project is dedicated to them.

Firstly, I would like to thank my supervisor, Dr John Tse. He enlightened me on issues about positive psychology and prevention of depression. Studies of depression prevention have been explored in some way but using positive psychology is definitely an innovative idea. I had a fruitful year indeed. Thank you for your trust in me and empowering me to learn from doing this project.

I would also like to express my appreciation to Dr Wong who gave me kind advice on my research. Without her generous guidance, I would not believe this paper could be written. My gratitude to her could never be simply in words.

Then, I would like to thank Kathy Chan, Patrick Lam and Stephen Lam for series of panel review. Their professional opinions helped me to develop the Positive Program. They also trained me up in leading a group activity in school setting.

Finally, Ms Chan and Mr Cho have been my teachers since I was young. They gave me tutorial about teaching when they knew that I was coming back for this project. They spent a lot of their own time on helping me up.

Thank you everyone who cares my project.

Abstract

Objectives. The aim of this paper is to explore the insufficiently studied problem of the effectiveness of a depression prevention program with positive psychology components. Specifically, the project aims to (1) design a prevention program with positive psychology concepts, (2) implement the program in a sample of adolescents, and (3) assess the effectiveness of the program.

Methods. Forty-one third-formers (23 males, 18 females) were recruited in the intervention group, and forty-two (22 males, 20 females) were assigned to the control group. The intervention group received the Positive Program, while the control group did not. Assessments were conducted at three points—pre-intervention, post-intervention, and one-month follow-up. Panel professionals supervised the facilitator to maintain intervention integrity.

Results. Among all variables, the strongest relationship was found between hopefulness and life satisfaction. Self-esteem was found to have the strongest correlation with depression, while social desirability only correlated with self-esteem and hopefulness. Only the intervention group reported significant attenuation in social desirability during post-intervention. Self-esteem was found to be the only significant predictor of depressive symptoms. Social desirability was not associated with depression in this study. Hope was a significant predictor for both happiness and life satisfaction. Happiness was also found to be a mediator to the link between hopefulness and life satisfaction.

Discussion. Measuring happiness and life satisfaction might help measure the effect of the Positive Program on students with minimal symptoms. Establishing hope among adolescents might help enhance their happiness and life satisfaction as a buffer against depression. Although social desirability failed to support its effect in a

prevention program, it should be noted that the current scale could be more reliable. Further studies could provide more information in considering the reduction of social desirability as a protective factor in depression prevention.

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Introduction

There are many studies and reports involving statistical data on depression. The prevalence of depression in Hong Kong was found to be 2.2% (Stewart, Lewinsohn, Lee, Ho, Kennard, Hughes & Emslie, 2002). The incidence rate reported by the Department of Health, Hong Kong Special Administrative Region (HKSAR) (2003) was about 0.4%-8.3% during adolescence. These figures raised concerns in local society.

However, studies in the West have focused on the consequences of depression. There are studies on the economic and psychological costs of depression in society (Cozolino, 2002; Lynch & Clarke, 2006; Mũnoz, 1997); however, there is inadequate information in this respect for Hong Kong. Compared with previous studies of estimates in the West, the situation in Hong Kong is not relatively optimistic. The territory is believed to be disadvantaged in its future financial burden and human development.

Prevention is one of the more popular strategies implemented to cope with widespread depression. The literature on depression prevention contributed to the development of the field (Gillham, Shatté, & Freres, 2000; Sutton, 2007). Mũnoz (1997) highlighted that prevention could help individuals avoid the pervasive disregulation of brain functions during the onset of depression.

In the United States and Australia, studies on preventing depression started in the early 1990s (Gillham et al., 1995; Shatté, 1996; Merry, McDowell, Wild, Bir, & Cunliffe, 2004; Shochet, Dadds, Holland, Whitefield, Harnett, & Osgarby, 2001). Raising self-esteem has been consistently adopted in their programs. Some Western studies suggest that a lower self-esteem contributed much to the development of depressive disorders (Cicchetti & Toth, 2005; Piko & Fitzpatrick, 2003).

Meyers and Meyers (2003) proposed a framework for depression prevention intervention using positive psychology. Their main idea was that prevention programs should enhance subjective well-being (SWB) rather than simply dismantle depressive symptoms. From the perspective of positive psychology, SWB should be an outcome measure in a prevention study instead of only depressive symptoms. Measuring happiness and life satisfaction was also believed to help understand the effect of a prevention program on participants with minimal symptoms.

Positive psychology also suggested that enhancing hopefulness could be a strategy to build up an emotional buffer as a prevention strategy. Developing goal-pursuing strategies could help enhance one's hopefulness (Snyder, Lopez, Shorey, Rand, & Feldman, 2003).

Most studies are from the West; meanwhile, the current study addresses cultural issues. Research indicates that interpersonal harmony is a significant predictor of depression in Asian communities. Suh (2002) expounded on the relationship between social desirability and depression in the Asian context. As for the Hong Kong Chinese, this postulate was believed to help formulate a prevention program.

The aim of this paper is to explore the insufficiently studied problem of the effectiveness of a depression prevention program with positive psychology components. Specifically, the project aims to (1) design a prevention program with positive psychology concepts, (2) implement the program in a sample of adolescents, and (3) assess the effectiveness of the program.

The next chapter reviews the literature on depression. Definitions and types of prevention will be presented, and the benefits of a prevention program will be discussed. Previous prevention programs with a traditional approach will then be

examined, followed by an evaluation of suggestions on outcome measures and a prevention framework from positive psychology. Cultural issues in formulating a prevention program will also be justified.

Literature Review

Depression

Definition of Depression

Traditionally, the International Statistical Classification of Diseases and Related Health Problems—the 10th Revision (ICD-10) identified that typical individuals who suffer depressive episodes may experience "depressed mood, loss of interest and enjoyment, and reduced energy leading to increased fatigability and diminished activity" (Carr, 2006). Generally, depressed individuals are characterized as showing sadness and woe. Studies obtained from the West suggest that the first onset of depressive disorder could possibly occur in mid- or late adolescence (Dobson, Scherrer, & Haubert, 2006). In this section, the prevalence of depression in different regions and Hong Kong as well as its possible costs will be reported and discussed.

Prevalence of Depression in the Adolescent Population

A recent report by the World Health Organization (2008) indicated that depression is the second cause of disability adjusted life years in people aged 15-44 worldwide. The prevalence of depression has been investigated over the world. Chang, Hahm, Lee, Shin, Jeon, Hong, Lee, Lee, and Cho (2008) reported lifetime and one-year prevalence of depression as 16.9% and 10%, respectively in the United States. The situation in Asia is suggested as less severe. Lifetime prevalence rates were 3% in Japan and 2.8% in South Korea, while the prevalence of one-year period depression was 1.2% and 2.3% in Korea. Malaysia reported the prevalence of possible depression among adolescents as 10.3% (Ramli, Adlina, Suthahar, Edariah, Ariff, Narimah, Nuraliza, Fauzi, & Karuthan, 2008).

In Hong Kong in 1999 to 2000, some researchers found that the point prevalence of depression among adolescents was around 2.2% (confidence interval =

1.3% to 3.1%) by structured diagnostic interviews with the sample (Stewart et al., 2002). The government documented an incidence rate of 0.4%-2.5% in childhood and 0.4%-8.3% in adolescence in 2003 (Department of Health HKSAR, 2003). The sharp rise in incidence rate from childhood to adolescence stages implied that the population has been increasingly affected by depression. A survey conducted in 2006 suggested that 40% of first formers to third formers were classified as depressed as they scored more than 15 points in the Center for Epidemiological Studies-Depression Scale (CES-D; Mingpao, 2006a). It also showed that one in four students in the study has been identified as having "severe depression." The effects of seasonality or examination were shown by another report conducted before an examination study period in which only 20% of the surveyed students were classified as depressed cases (Mingpao, 2006b). Although statistical results on depression vary, depression is a problem in the territory.

Costs of Depression

Depression involves substantial loss in capital and human resources that can result in major consequences. The costs of depression could be estimated from the economic and psychological perspectives.

In the United States, economists emphasized the financial costs of general and specialty mental health services (including medication and emergency services), school-based services, and long-term care (costs incurred in handling patients in hospital and continuous outpatient follow-up) (Lynch & Clarke, 2006). The annual expenditure on a child with depression was estimated to be HK$17,350 to HK$29,500. Supporting the ongoing treatment for depressed children therefore put heavy financial burdens on the local health department, non-government organizations, and secondary schools.

In addition, the psychological costs to society are not negligible because depression could permanently alter the regulation of humans. Relapse into depression could possibly be caused by permanent changes in the brain (Cozolino, 2002). In Hong Kong, the average length of a relapse period of depression could be as long as seven to eight months, but about 10% of patients suffer a prolonged period of two years (Department of Health HKSAR, 2003). Not only was long-term care costly, but there was also possible psychological distress that extends to the patients' family. Dysfunctional parenting styles are common among depressed parents. As a result, children raised by depressed parents are likely to suffer from depression as well (Mũnoz, 1997).

Given that the prevalence of adolescent depression is increasing, estimates of the costs incurred, both financially and psychologically, are believed to be useful toward addressing the problem in Hong Kong society.

Depression Prevention

Definition of Prevention

Sutton (2007) defined prevention as "interventions that occur before the initial onset of a disorder." Gillham and his colleagues (2000) generalized a simple definition indicating that the timing of an intervention program's delivery is important, that is, before the onset of a clinically diagnosable disorder. This is why the sample subjects in most research could be questioned on whether the subjects are already clinical but not yet diagnosed. In this section, different types of prevention would be presented. The benefits of having a prevention program will also be discussed. Traditional prevention programs will be introduced and analyzed, and their strategies will be examined and their limitations criticized.

There are three types of prevention programs, namely, universal, selective, and indicated (Sutton, 2007). Universal prevention is intervention conducted on the general population; selective prevention on the population with elevated risk; and indicated prevention to those showing symptoms of disorder, or who are sub-clinical. Since universal and indicated prevention might include individuals with clinical signs and symptoms, perhaps only a selective prevention program might include non-clinical cases alone. Contemporary programs might not be truly preventive in nature (Gillham et al., 2000). However, normal school settings might provide a mixture of non-clinical, at-risk, sub-clinical, and clinical students. A single category of students might not always be available for research purpose.

Benefits of Prevention Program

If depression has been negatively affecting the development of adolescents, prevention could benefit their quality of life. Prevention programs that effectively reduce the onset of depression benefit both individuals and the society.

First, prevention could be a strategy to stop further increases in incidence rates. On the other hand, the massive and pervasive disregulation of functioning associated with major depression causes permanent physiological changes that make people more prone to the disorder again. By stopping depression from happening, preventive measures allow program participants to avoid entering a depressive state in the future (Mũnoz, 1997).

On a societal level, the financial burden of treatment for depression could be alleviated. Prevention could address this problem, and it has been widely recognized as an effective approach toward treating depression (Wong, Cheung, Chan Ma, & Tang, 2006; Collins, Westra, Dozois, & Burns, 2004; Mũnoz, 1997). The familial

effect of depression as previously discussed could also be prevented, therefore stopping the spread of the onset of depression to offspring.

Traditional Approach to Prevention Program for Depression

There are different programs in the literature. Of those programs purely for depression, the Pennsylvania Resilience Program (PRP) in the United States and the Resourceful Adolescence Program (RAP) in Australia are the most well known.

Pennsylvania Resilience Program. PRP originated from the University of Pennsylvania in the mid-1990s (Cardemill, Reivich, & Seligman, 2002; Gillham, Hamilton, Freres, Patton, & Gallop, 2006; Gillham, Reivich, Freres, Lascher, Litzinger, Shatté, & Seligman, 2006; Gillham, Reivich, Jaycox, & Seligman, 1995; Shatté, 1996). This program typically consisted of 12 sessions and emphasized cognitive-behavioral change and social problem solving ability. The initial research done by Gillham et al. (1995) concluded that these components could enhance psychological resilience to depression as a sample of 118 children significantly showed reduced levels of depressive symptoms. The effectiveness was demonstrated by a sustainable result in the two-year follow-up period. Interestingly, Shatté (1996) later found that the cognitive component in PRP might be more effective on males; the experiential component, demonstrated in another activity as pseudo-PRP, was found to be a more effective ingredient for females. PRP is the most studied prevention measure in the West.

In PRP, there are a few points to highlight. The self-report assessments of depressive symptoms are mainly their outcome measures. Both Gillham et al. (1995) and Shatté (1996) adopted Children's Depression Inventory (CDI), while Reynolds Adolescent Depression Scale (RADS) was only used by the former researcher. They only used scales concerned with depressive symptoms as outcome measures. The

improvement of students with minimal symptoms could be overlooked because these scales do not reflect the benefits of preventive measure. Self-esteem was traditionally regarded as a strong predictor of depression in the West. It was then selected as a component in the prevention program (Shatté, 1996).

Resourceful Adolescent Program. RAP was developed for Australian adolescents (Merry et al., 2004; Shochet et al., 2001). This program was initially delivered with 12 sessions that contained a variety of techniques, such as cognitive restructuring, systematic relaxation, and social support access (Shochet et al., 2001). The study also resulted in the reduction of depressive symptoms and level of hopelessness. It reported high levels of satisfaction with the program. Merry et al. (2004) brought the program to New Zealand and amended it to cater to the culture of local adolescents. This 11-session program also resulted in a significant drop of depressive symptoms.

The use of RADS was found in both RAP studies. While Schochet et al. (2001) also measured their outcome by CDI and the Beck Hopelessness Scale, Merry et al. (2004) included the Beck Depression Inventory II. As they intended to conduct RAP as a universal prevention program, measuring the outcome of minimally symptomatic adolescents could be difficult. Self-esteem was consistently supported as the prime component in RAP. Both studies spent some time enhancing the self-esteem of participants. Albeit an increasing number of Asian students in Australia, self-esteem might still be a strong predictor of depression.

Traditional Approach to Prevention Strategies

Consistently, self-esteem was found to be a key concept in prevention strategies. Both PRP and RAP included self-esteem enhancement in their program content.

Self-esteem. The review by Cicchetti and Toth (2005) pointed out that self-esteem mitigated against adolescent depression. Both PRP and RAP included sessions on self-esteem enhancement (Shatté, 1996; Shochet et al., 2001). In a sample of Eastern European teenagers, Piko and Fitzpatrick (2003) found that self-esteem significantly correlated with depression; however, no interaction between gender and self-esteem was found to influence depression.

Limitations of Previous Prevention Studies

The effect of cognitive-behavioral and interpersonal techniques was sometimes questioned. Cognitive-behavioral techniques might require a long duration to be effective (Sutton, 2007). Despite interpersonal theories, scholars also look for new perspectives on prevention (Shatté, 1996; Meyers & Meyers, 2003).

Reviewing PRP and RAP reflected the shortage of prevention activities on the Asian population. Until now, research on depression prevention is rarely found in the Asian context. The education system and classroom situation might have great differences between the West and Hong Kong. Although self-esteem was found to be a strong predictor of depression in the West, direct replication of PRP and RAP in the Hong Kong context might be inappropriate given the uniqueness of the Westernized Chinese culture in the territory.

In addition, measuring only depressive symptoms might not cover assessments on the effectiveness of a depression prevention program on adolescents with minimal depressive symptoms (Gillham et al, 2000); this is especially true when the program is designed to build a buffer to depression.

Positive Psychology to Prevention

New Perspectives to Depression Prevention

Traditionally, studies concerning depression prevention emphasized the absence of depressive symptoms. The reduction of symptoms among subjects was generally regarded as the successful result of potent intervention. It seems that the mission to deliver prevention services was to bring depressive symptoms to zero.

There are directions for preventive measures between the two perspectives. Meyers and Meyers (2003) had different terminologies for traditional and positive psychology. They termed "transmission mode" as the point of view from the attenuating level of sub-clinical depression, and referred to "transaction mode" as making the improvement of quality of life as the treatment objective. From the perspective of positive psychology, the prevention of depression should be done by enhancing well-being rather than just reducing symptoms. Positive psychologists suggest that there is a trichotomous continuum of affect because the absence of depressive symptoms does not necessarily lead to the presence of well-being. Grounded on these theoretical frameworks, positive psychotherapy emphasizes ameliorating symptoms of disorder and simultaneously building up "positives" (Seligman, Rashid, & Parks, 2006). There are differences between the suggested outcome measures and prevention strategies between the two perspectives.

In the following section, we will discuss the suggested outcome measure of SWB. The arguments about SWB will be discussed, and its relationship with depression will also be presented. Strategies on positive psychology as suggested in a prevention program will also be examined.

Subjective Well-being (SWB)

SWB is a core of positive psychology. Diener (2000) defined SWB as the cognitive and affective evaluation of one's personal satisfaction. Operationally, it is recognized as positive emotion, life satisfaction, and lack of negative emotion (Diener, 1984 & 2000; Hodges & Clifton, 2004; Pavot & Diener, 2004). While the concept of SWB emphasizes personal experience (Diener, 1984), results of a review by Compton (2005) revealed that people with high subjective happiness and life satisfaction were rated by their acquaintances as "happier." Hence, personal perception of one's own well-being might not be obviously different from the perceptions of people around them.

Depression and SWB: Top-down and bottom-up argument. The relationship between depression and SWB is also evident. Depression was regarded as one of the facets in SWB, a concept developed through a long history of argument. The top-down and bottom-up approach gave directions to the definition of SWB, and depression was believed to constitute SWB in the later perspective.

Whether depression is a facet of SWB originated from an argument for interpreting SWB as a trait or state construct. Although the argument is still a paradox, many discussions came after Diener's first assumption of SWB as a transient state (Diener, 1984). It was supported because narrower measurements into facets were believed to enhance the sensitivity of reflecting variables of state emotion (Diener, Suh, & Oishi, 1997). SWB was first studied based on the bottom-up approach, which favored relating depression to SWB.

This practice generated reflection on the possibility of studying SWB from the top. To distinguish the concept from its bottom-up version, scholars described the top-down perspective of SWB as global and retrospective (Diener, Suh & Oishi, 1997;

Schimmack, Radhakrishnan, Oishi, & Dzokoto, 2002). This general SWB was believed to be related to genes and the cognitive schema (Compton, 2005). Cozolino (2002) also related depression to physiological structure and cognitive schema. Even in the sense of trait approach, depression and SWB might possibly be caused by related biological or genetic systems.

Interestingly, there is still no absolute top-down or bottom-up SWB in academia. The lack of depression, or absence of negative affect, was commonly recognized as a component in SWB. There is no rigid definition in positive psychology. Compton (2005) commented that people could be triggered to activate either the top-down or bottom-up perception of SWB when asked to come up with abstract or specific answers. It seemed that the concept could never be truly global or specific because measures of global life satisfaction could be influenced by momentary mood (Diener, 2000). Therefore, the trait-and-state issue was still in question. The bottom-up SWB explained the variance insignificantly; this favors the top-down approach (Diener, Suh, Lucas & Smith, 1999). Compton (2005), nevertheless, wondered about the rationale of adopting the trait approach, which suggested that personality was important to one's SWB. The increasing popularity of studying SWB in different components benefited the consideration of taking depression into the concept.

Consensus of SWB. Despite the ambiguity of understanding SWB as trait or state, psychologists came to a consensus about three distinctive components in it—positive affect, lack of negative affect, and life satisfaction (Diener, 1984 & 2000; Hodges & Clifton, 2004; Pavot & Diener, 2004). As previously mentioned, this postulate was consistent with the definition of SWB that both affective and cognitive evaluations of one’s satisfaction account for individual perception. Diener, Suh, and

Oishi (1997) isolated that affective and cognitive facets were interrelated. The construct of SWB could be partitioned into the affective and cognitive domains. Depression was studied in the affective evaluation of one's well-being.

Depression as a component. The dual nature of affect proposed to include both positive and negative affects into SWB. Diener (1984; 2000) noted that positive and negative affects were different constructs and that there were different physiological systems that serve pleasant and unpleasant emotions. A higher activation of the left hemisphere of the brain was found to be related to non-clinical individuals, while the right highly correlated with the depressed (Cozolino, 2002). As a continuum, the absence of depression should be no depression, and the absence of happiness should be also no happiness. Logically, happiness could only be one of the options of no depression; there should be a choice of neutral mood. In the same sense, Meyers and Meyers (2003) pointed out that the transmission method, which remedies the deficits of people, was different from the transaction mode, which builds on positive attributes to well-being. This suggested the trichotomous nature of the positive-negative continuum. Under this idea, reducing negative emotion by reducing symptoms could not correspondingly enhance any positive emotion (Pavot & Diener, 2004). Including both positive and negative affects in SWB seemed necessary. Since there was a postulate for positive and negative affects being separable, the present study adopted independent measures for depression and subjective happiness instead of a single measure (e.g., PANAS). According to suggestions by Duckworth, Steen, and Seligman (2005), the CES-D (Radloff, 1977) and the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999) were adopted in this project as quick-check instruments.

Happiness as a component. In contrast to the previous paragraph about depression, positive emotion was defined as momentary pleasures and enduring gratifications (Carr, 2004). When happiness is referred to an emotional state, it indicated how people feel about their world and themselves (Compton, 2005). Depression as the center of prevention studies was believed to be buffered by a high degree of happiness. In quantitative terms, depression and happiness were proposed to be inversely correlated (Whalen, Jamner, Henker, & Delfino, 2001; Duckworth, Steen & Seligman, 2005). Having a happiness assessment could measure the effect of the prevention program on adolescents with minimal depressive symptoms—whether they could be improved by enhancing their well-being.

Life satisfaction as a component. Regarding life satisfaction as the cognitive component in SWB, it was argued to be a domain-specific or domain-general construct. Compton (2005) defined a global measure of life satisfaction as the general acceptability of one's life. In contrast, Schimmack et al. (2002) further supported that our general affective dispositions and genes directed our situation-specific life satisfaction. Diener's explanation for domain-specific life satisfaction was due simply to the influence of one's daily activities on life satisfaction (Diener, 1984). Ironically, the first version of general life satisfaction measurement—Satisfaction with Life Scale (SWLS)—was developed by Diener and colleagues (1985). After two decades, with respect to the unique characteristics of the Chinese culture, Ho and Cheung (2007) formulated a measure for interpersonal and intrapersonal life satisfaction by applying exploratory factor analysis to samples from the Mainland (validation was also done by a confirmatory factor analysis among Hong Kong Chinese in their article). To reflect the reality among the Hong Kong Chinese, the expanded SWLS (E-SWLS) was then

adopted in this study. Having this assessment in the outcome measurements could evaluate whether a prevention program could enhance well-being.

Although the relationship between affects and cognition was mentioned (Diener et al., 1997), Schimmack et al. (2002) provided evidence that hedonic balance, which is the state between positive and negative emotions, impacted our life satisfaction judgments. They further explained that it was influenced through the memory of our past experiences. Depression was also adopted as the predictor of life satisfaction in other studies (Hart, Hanks, Bogner, & Millis, 2007). Previous literature might provide possible explanations on this issue of the affect-cognition priming model, which described the relationship as a result of the priming effect of depressive affect to our cognition (Wheeler & Miyake, 1992). Evidence of this model was upheld because affect priming was found to be more significant when a person deals with complex and ambiguous social judgements. In this study, depression and subjective happiness were examined to see whether they were strong predictors of life satisfaction.

Positive Psychology as a Prevention Strategy

In the past two decades, positive psychology has been employed to study depression prevention. Although the traditional approach to depression prevention programs emphasizes symptom reduction in the assessment of program effectiveness, positive psychology emphasizes the enhancement of SWB in which "lack of depression" is one of the components besides subjective happiness and life satisfaction (Diener, Suh, & Oishi, 1997; Diener, Suh, Lucus, & Smith, 1999; Diener, 2000; Schimmack, Radhakrishnan, Oishi, & Dzokoto, 2002; Hodges & Clifton, 2004; Compton, 2005; Duckworth, Steen, & Seligman, 2005).

The traditional approach of psychopathology aims to reduce deviant behaviors, thoughts, and affects. To treat a psychological disorder, this approach targets on alleviating the negative signs or symptoms of depression. For depression, the treatment designed using the traditional approach aims to dismantle the negative cognitive style associated with depression. Nevertheless, the effectiveness of prevention programs formulated by the traditional approach has been controversial (Sutton, 2007).

When research was being conducted on PRP and RAP, positive psychology was born in Pennsylvania which, coincidentally, was the birthplace of PRP. Treatment programs founded on positive psychology aim to promote the optimal functioning and well-being of an individual and "install" positive adaptation to facilitate human well-being and thereby counteract adversity. Although there was still a shortage of research, especially evidence-based ones, in positive psychology, Meyers and Meyers (2003) proposed a theoretical framework for designing preventive programs. According to this framework, positive development emphasized SWB, competence, and external supports; it also managed vulnerabilities from individual predisposition, stress, and exploitation. In particular, self-esteem and hope have been hypothesized as the major components in the framework that enhances SWB.

Hopefulness. While hopelessness is one of the core constructs in depression research following the traditional approach, hopefulness is one of the important constructs in positive psychology. The traditional approach conceptualized hopefulness as the absence or opposite of hopelessness (Needles & Abramson, 1990). Snyder and his colleagues, however, postulated the concept of hope in terms of pathways and agency, which emphasizes building up, not eliminating. This hope theory recommended that strategies to hope enhancement focus on pathways, which

referred to planning possible steps to achieve a goal and agency defined as persistence to attain a goal (Hodges & Clifton, 2004; Snyder et al., 2003). They further pointed out that lower-hope children correlated with depression (Snyder, Hoza, Pelham, Rapoff, Ware, Danovsky, Highberger, Rubinstein, & Stahl, 1997). It might have been because unsuccessful goal-pursing behavior might hurt children's self-worth, and low hope led to a pessimistic explanatory style and, in turn, depression (Snyder et al., 2003). Hopefulness was found to be a strong predictor for the level of depression despite the possible influence of social appraisals and coping mechanisms.

There are a number of studies about hope and SWB, especially subjective happiness as a facet. Many theorists proposed that attaining a goal could enhance one's happiness and life satisfaction. They further explained the reason behind a person-environment fit (Diener, 1984; Diener, Suh, Lucas, & Smith, 1999; Carr, 2004). Although not much evidence could prove this postulate, it has been emphasized that environmental context could play an essential role in the level of happiness and life satisfaction of an individual. Intrinsic motivation was derived from satisfying a human need, so working on a motive-congruent goal was found to be positively related to SWB.

From this review, the relationships among the three constructs in positive psychology were of interest. Schimmack et al. (2002) suggested that subjective happiness could be a predictor of life satisfaction. In addition to hopefulness as a predictor of life satisfaction and happiness, the suggestions of Schimmack et al. (2002) could help elaborate that subjective happiness might somehow mediate the relationship between hopefulness and life satisfaction. Such a framework was of huge contribution to depression as well.

Cultural Issues

Preventive Services Currently Available in Hong Kong

There have been inadequate psychological services and evidence-based research in Hong Kong. The Christian Family Service Centre (2004) estimated about 20,000 students in the territory with depressive symptoms and pointed out that the availability of psychological service was running short. Indeed, there was no official prevention measure for adolescent depression in Hong Kong. Since 2003, an unofficial prevention campaign has been run by the Department of Social Welfare and the boards of Wong Tai Sin and Sai Kung districts (羅澤全, 2007). Although there has been an increase in the number of participating organizations, no scientist-practitioner study has ever been conducted for the effectiveness of the campaign. In studying prevention for depression, the need for science-informed research has not been addressed in Hong Kong.

Cultural Issue in Prevention Strategies

Nevertheless, Suh (2002) suggested that self-esteem might not be a strong predictor of depression and well-being in collectivistic society. It was understandable that domestic studies usually included relationship as a predictor of depression (Cheung, 1995; Lau & Kwok, 2000; Stewart, Betson, Lam, Chung, Ho, & Chung; 1999) because Russell, Crockett, Shen, and Lee (2008) also remarked that collectivists might evaluate themselves in terms of the well-being of significant others and their ability to satisfy them. Social networking was postulated to overwhelm the effect of personal success. Stewart, Kennard, Lee, Hughes, Mayes, Emslie, and Lewinsohn (2004) also agreed that the communal culture of the Chinese was a protective factor in their society. Based on these data, the relationship between self-esteem and SWB was assured. Compton (2005) suggested that a high self-esteem led

to a sense of meaning and value. It may be an important predictor of SWB among adolescents in the West, but perhaps not in China. Instead, family and social cohesiveness were suggested as the relatively important factors among the Chinese; Chou (1999) echoed this.

Social desirability. Social factors are an important predictor in studying depression among Chinese adolescents. In the early 1990s, Cheung (1995) found a significant direct effect of affiliation and social support on depression in a Hong Kong Chinese sample. Lau and Kwok (2000) then studied cohesiveness and conflict in family relationships. They found that cohesive, orderly, and achieving families correlated with more positive developments and lower depression level. Suh (2002) further provided evidence that identity consistency might not be as valued as social appraisal among Asians. Social desirability could perhaps explain the importance of social appraisal as a predictor of one's SWB. For Asians, being accepted by family and friends might be more important than being congruent across situations.

Hypotheses

The focal hypotheses were established as the following for this study:

Hypothesis 1—Outcome: Participants who took part in the Positive Program score significantly lower on depressive symptoms but high on SWB measures than their control counterparts.

Hypothesis 2—Predictors

a. Self-esteem and hopefulness significantly predict the components of SWB positively such that a higher SWB is predicted by higher self-esteem and hopefulness.

b. Social desirability significantly predicts the components of SWB negatively such that a higher SWB is predicted by a lower social desirability.

Hypothesis 3—Mediators: The effects of self-esteem, social desirability, and hopefulness on life satisfaction are mediated by an affective evaluation of well-being.

Methodology

Participants

Purposive sampling was adopted in the present study. A total of 83 third-formers from two classes (male = 45, female = 38) were recruited from the Tuen Mun Catholic Secondary School. The average age was 14.33 years (standard deviation [*SD*] = 0.76 years), ranging from 13 to 17 years. Most of the participants (85.54%) had married parents, and the sample had an average of 1.35 siblings. The proportions of the subjects living in public rent flats, subsidized sale flats, and private residential flats were 39.2%, 25.3%, and 32.9%, respectively. The majority of the sample did not endorse any religious beliefs.

Table 1
Comparison of Demographic Characteristics of Sample and Population

Variables	Population (Hong Kong)	Population (Tuen Mun District)	Sample from the participating school
	%	%	%
Housing			
Public rent flats	31.02	32.81	39.2
Subsidized sale flats	17.79	25.52	25.3
Private residential flats	47.47	37.83	32.9
Others	3.72	3.84	2.6
Gender			
Male (10-14)	51.37	50.75	--
Female (10-14)	48.63	49.25	--
Male (15-19)	50.85	51.44	--
Female (15-19)	49.15	48.56	--
Male (10-19)	51.1	51.11	54.2
Female (10-19)	48.9	48.89	45.8
Marital ratio			
The married to the Divorced (ratio)	18.06:1	14.84:1	14.2:1

Note. Population characteristics were obtained from Census and Statistics Department, The Government of Hong Kong Special Administrative Region, 2006.

To determine the degree of representation of the study, the demographic variables of the sample were compared with the population characteristics of the Tuen Mun District and the entire Hong Kong population. Table 1 shows that the sample showed relatively similar percentages and ratios in three socio-demographic variables

(including housing, gender by age groups, and marital ratio) with the population in Tuen Mun and in Hong Kong.

Table 2 reports the demographic characteristics of the intervention and control groups. No significant differences on age (t (78) = -0.79, $p > 0.05$) and number of siblings (t (77) = 0.63, $p > 0.05$) were found between the intervention and control groups. The results of the chi-square tests yielded no significant differences on gender (χ^2 (1, 83) = 0.12, $p > 0.05$), categories of marital status of parents (χ^2 (2, 79) = 0.54, $p > 0.05$), type of housing (χ^2 (3, 79) = 4.98, $p > 0.05$), and among categories of religion participation frequency (χ^2 (5, 80) = 6.60, $p > 0.05$) between the intervention and control groups.

Table 2
Demographic Characteristics between the Two Groups

Variable	Intervention Group (n = 41)	Control Group (n = 42)	Group Difference*
	n (%)	n (%)	
Age; M (SD)	14.26 (0.72)	14.39 (0.8)	0.434
Siblings; M (SD)	1.42 (1.03)	1.29 (0.78)	0.533
Gender			0.734
Male	23 (56.1)	22 (52.4)	
Female	18 (43.9)	20 (47.6)	
Marital status of parents			0.765
Married	35 (89.7)	36 (90.0)	
Divorced	3 (7.7)	2 (5)	
Single	1 (2.6)	2 (5)	
Type of housing			0.173
Public rent flats	13 (33.3)	18 (45.0)	
Subsidized sale flats	8 (20.5)	12 (30.0)	
Private residential flats	16 (41.0)	10 (25.0)	
Others	2 (5.1)	0 (0.0)	
Religion Participation			0.252
Not at all	32 (82.1)	30 (73.2)	
1-2 times a year	2 (5.1)	7 (17.1)	
3-11 times a year	0 (0.0)	1 (2.4)	
1-3 times a month	4 (10.3)	1 (2.4)	
Once a week	1 (2.6)	1 (2.4)	
More than once a week	0 (0.0)	1(2.4)	

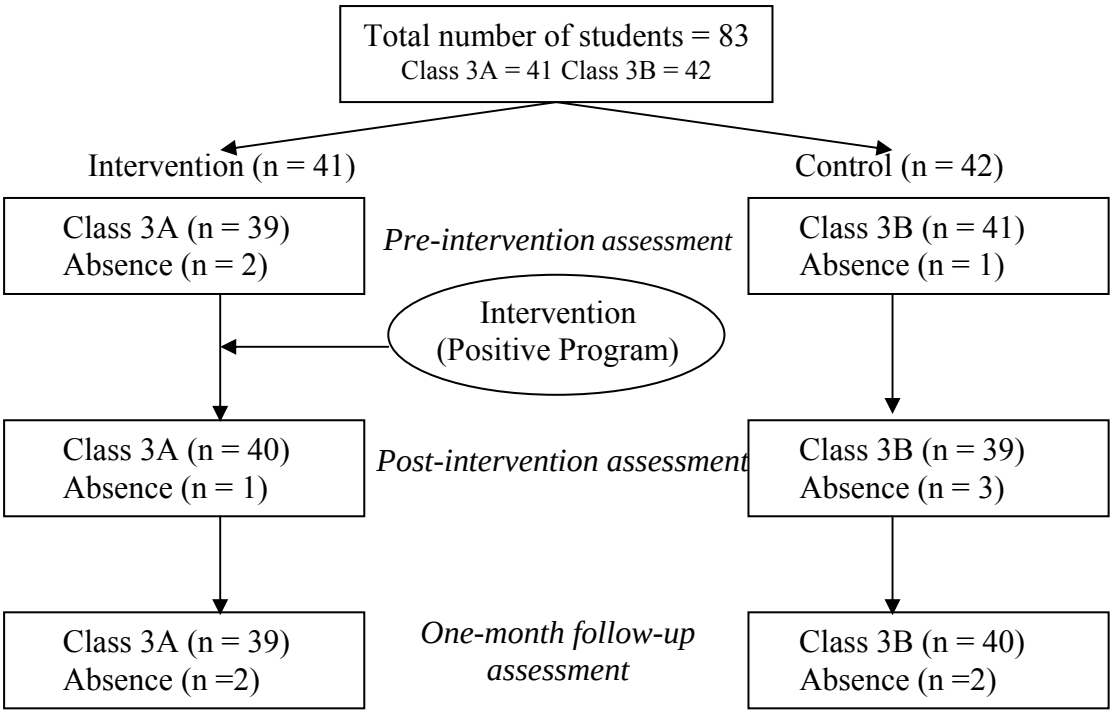
*Categorical variables were evaluated with chi-square tests whereas continuous variables were assessed with t-tests.

Procedures

A non-equivalent control group design was adopted in this study (Mitchell & Jolley, 2001). During the within-subject experiment, the subjects in the intervention group received the Positive Program, while the control group did not. As shown in Figure 1, only participants in the intervention group were exposed to the Positive Program. All participants from the intervention and control groups were assessed at pre-intervention, post-intervention, and follow-up.

Figure 1

Experimental Design of the Present Study



Assessments

Pre-intervention assessment. All participants were required to have a pre-intervention assessment. Designated questionnaires were distributed to students who were from the assigned classes of the participating secondary school. The assessment was conducted during class by the facilitator.

Post-intervention assessment. At the end of the experiment, participants of both groups were required to have the post-experiment assessment. To minimize potential carryover effect, the items of the questionnaires designated were arranged in a different order.

Follow-up assessment. The follow-up assessment was conducted after school, and the order of the questionnaire items was different from the previous two assessments to minimize potential carryover effect. The procedure was also the same as the previous two assessments in that the students stayed after school to complete the questionnaire.

Instrumentation and Materials

Depressive symptoms. The Centre for Epidemiological Studies-Depression Scale (CES-D) was adopted to measure depressive symptoms. CES-D consists of 20 questions (e.g., "My sleep was restless") rated on a four-point scale (0 = "rarely or none of the time;" 3 = "most or all of the time"). Orme, Reis, and Herz (1986) accepted the validity of the English version. The Chinese version of the instrument used in this study was validated by Ying (1988). There were four subgroups in the scale, namely, depressive affect, positive affect, somatic symptoms, and interpersonal relationships (McCauley, Pedroza, Brown, Boake, Levin, Goodman, & Merritt, 2006). The results were tallied, and higher scores indicate a higher severity of depression level. Internal consistency reliability was good ($\alpha = 0.77$) in the Chinese version of CES-D by Ying (1988). Divergent validity was ensured by negative correlation with the Rosenberg Self-esteem Scale (RSES) (Rosenberg, 1965). As Ying (1988) echoed in her validation study of the Chinese version of CES-D: numerous studies have demonstrated the external validity of the scale among Mexican-American, Black, and

Asian subjects. The internal consistency of this study was secure (α = 0.89). Approval was obtained to use the scale in this study.

Subjective happiness. Considering the subjective interpretation of happiness, Lyubomirsky and Lepper (1999) developed a four-item scale, the SHS. Each question (e.g., "Compared to most of my peers, I consider myself") was answered using a 7-point Likert scale ranging from 1 ("less happy") to 7 ("more happy"). Higher scores meant higher levels of happiness. In the sample of high school students, the value of Cronbach's alpha of 0.81 was reported to demonstrate its reliability, while the range of alphas from 0.79 to 0.94 was recorded from other samples. Evidence of convergent validity was also provided because SHS correlated with SWLS (Diener, Emmons, Larsen, & Griffin, 1985) with a Cronbach's alpha from 0.61 to 0.72 (Lyubomirsky & Lepper, 1999). They also ensured the suitability of the scale for different age groups. The scale was translated to Chinese by a qualified translator using back-translation by a mental-health professional. Internal consistency was good (α = 0.72) in the present study.

Life satisfaction. Diener and his colleagues developed the SWLS in 1985. Pavot and Diener (1992) reviewed the scale and assured the purpose of the assessments for measuring general life satisfaction of respondents. While cultural issues were raised by Ho and Cheung (2007), the Chinese cultural value of interpersonal relationship was taken into account during the revision of the scale. The E-SWLS was then produced to cater to the culture-specific measure of life satisfaction of family members on the respondents' report for Chinese subjects. It contained 11 items rated on a 7-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). A higher level of life satisfaction was marked by higher scores. In the E-SWLS, both interpersonal and intrapersonal domains were analyzed in the study

and achieved good reliability (e.g., “My family members are satisfied with their lives”; “I am satisfied with life”). Ho and Cheung (2007) achieved a Cronbach’s alpha value of 0.9 in a sample of 1635 hospital staffs in Hong Kong. Factorial validity was explored in the Beijing samples and were confirmed in the Hong Kong ones (Ho & Cheung, 2007). The coefficient alpha of the present study was at 0.89 levels. Permission of using the measurement was obtained from the first author of the E-SWLS.

Self-esteem. RSES was adopted to measure self-esteem. It was developed in 1965 to measure global self-esteem. It has been a very popular assessment tool worldwide, as cited by Heatherton and Wyland (2003). There are 10 questions (e.g., “I take a positive attitude toward myself”) rated using a four-point Guttman scale ranging from 1 (“strongly agree”) to 4 (“strongly disagree”). A higher self-esteem is reflected by a higher score in the RSES. Schmitt and Allik (2005) achieved Cronbach’s alpha vales of 0.7 to 0.9 across different countries except in Africa. Construct validity was also demonstrated from the samples of different nations by correlating it to the Big Five Model (Schmitt & Alik, 2005). The coefficient alpha in this sample was 0.81. The use of RSES is free for academic purposes. In this study, the translation of the instrument was done by a qualified translator, and a mental-health practitioner revised it through back-translation.

Hopefulness. Snyder (2003) worked on the development of Children’s Hope Scale (CHS) from a sample of children aged 7 to 15. Hope was defined as the “overall perception that one’s own goal can be met” (Snyder, 2003). Six questions (e.g., “I think the things I have done in the past will help me in the future”) were designed on a six-point Likert scale ranging from 1 (“none of the time”) to 6 (“all of the time”). A higher score meant a higher level of hopefulness. The median of Cronbach’s alpha

values from different samples was 0.77. Convergent and divergent validity was also achieved. According to Lopez, Snyder, and Teramoto-Pedrotti (2003), CHS was found be negatively correlated with CDI, but it was positively correlated with the Self-Perception Profile for Children and Children's Attributional Style. The assessment tool was translated by a professional translator to Chinese and then was back-translated by a mental-health practitioner. This study achieved a Cronbach's alpha of 0.85.

Social desirability. The Crowne-Marlowe Social Desirability Scale (CMSDS) was employed in this study. Crowne and Marlowe (1960) originally developed the scale as a 33-item instrument for measuring behaviors that are culturally sanctioned and approved but are less likely to happen. In short, it is about one's desire to present him/herself in a favorable way. A short form of 10 items was established for time-limited administration (e.g., "I am always courteous, even to people who are disagreeable") (Strahan & Gerbasi, 1972). A lower score indicated lower defensiveness and social desirability. Although the answers were either "true" or "false," credible reliability and validity of the short form was assured. Strahan and Gerbasi (1972) reported 0.62 as the median alpha from different samples. The coefficient alpha of this study was 0.33. The short form was also found to be parallel to the validity of the original form. Translation to the Chinese version was done by a qualified translator and followed by back-translation.

Intervention

Two classes (3A = 41, 3B = 42) of the participating secondary school were recruited in the program. Based on the consensus of the school, students in 3A were assigned to participate in the intervention group. Students in 3B were assigned to the control group, which received no intervention.

The Positive Program was conducted in four consecutive Religion and Ethics lessons (80 minutes per session) for the intervention group. The total contact time was 320 minutes (5 hours and 20 minutes). Students in the intervention group were not required to prepare anything before class, while materials such as worksheets were provided in the program. The first part of each session helped the students revise ideas learned from the previous meeting.

Positive Program was a group-based intervention built on the frameworks of positive psychology. This program aimed to enhance student's positive emotions toward themselves and interpersonal relationships. In this program, students were expected to learn to (1) think positively about themselves to enhance their self-esteem, (2) plan and achieve goals to enhance their motivation and hopefulness, and (3) acknowledge and understand the feelings of others to facilitate their interpersonal relationships. The program consists of four 80-mintute sessions.

Session 1. This was designed to illustrate the difference between our self-perception and our significant others' perception of us. Students could learn the techniques to understand themselves better, and the difference between their self-perception and perspectives from others. Students were taught to be aware of their self-talk, which constitutes one's thought. Cognitive approach of self-talk was introduced, and cognitive restructuring of positive replacement for negative injunction was also demonstrated. Experiential techniques were adopted to help students think about their future self-concept.

Session 2. This focused on the concept of hope. Goal building techniques were taught to equip students with the potential to nurture hopefulness. Cognitive techniques were adopted to demonstrate goal planning. This session equipped

students with techniques to set specific goals, possible pathways, and agency strategies.

Session 3. This emphasized how interpersonal interaction is influential as demonstrated in an experiment. Listening skills were exhibited. The importance of expressing our feelings was emphasized, and techniques for understanding the feelings of others were also demonstrated.

Session 4. Assertiveness was demonstrated in terms of body posture, eye contact, speech, and tone of voice. Role-playing was used to help students learn to think according to others' perspectives. The activity was a cognitive approach used to position students in different perspectives.

The program was mainly delivered in group discussions in class. At the end of each session, a question for retrospection was posted on the overhead projector display. Homework was handed through e-mail. It provided opportunities to build rapport with students and sustain the effect of intervention.

Intervention Integrity and Attendance

A panel of professionals, including a counseling teacher, a social worker dealing with adolescents, and an occupational therapist, held a series of review meetings to evaluate the design of the program. All panel members possessed master's degrees in their professions and more than five years of experience in their own fields. The activities designed and the techniques adopted were modified based on the advice of the panel. The program facilitator was a postgraduate psychology student with experience working in the community and teaching in secondary school. In the final phase before the launch of the program, the panel trained the facilitator to deliver the intervention. Training emphasized the establishment of rapport with the students. After each session, the facilitator consulted the teachers of the collaborating

school and the panel for improvement. More operational comments helped amend the design of the Positive Program.

As suggested by Lane and Beebe-Frankenberger (2004), a self-report strategy was adopted to manage the intervention integrity. Four sheets of reports were developed. A detailed breakdown of specific steps in each activity was used in the integrity forms. Sample items of the integrity forms are "to demonstrate behaviors of respective listening to the class" and "to repeat the game and ask students to try to act the behaviors of respective listening." This also served as a prompt to facilitate program implementation. Using on a four-point scale for rating, the integrity form was designed to evaluate the consistency of implementation against the planned instructions. The sum of the points attained in each session was divided by the number of items to obtain the average; the total level of integrity could be processed by calculating the average points for each session. The self-report integrity form reported 3.54 out of 4 points on the average, which meant that 88.42% of the program was implemented as designed.

Data Analysis

Statistical Package for Social Sciences version 11 (SPSS 11) was adopted to analyze the data collected from the pre-intervention, post-intervention, and follow-up assessments. Descriptive statistics (mean, SD, frequency, percentages) were used to evaluate sample characteristics. Categorical variables were evaluated with chi-square tests, while continuous variables were assessed with *t*-tests. Sample characteristics in the CES-D, SHS, E-SWLS, RSES, CHS, and CMSDS were analyzed by independent sample *t*-tests. Pearson's *r* was also used to study the correlations among variables.

To test the effectiveness of the program, paired *t*-tests and repeated analyses of variance (ANOVAs) were used. Paired *t*-tests were used to analyze the mean

differences between different assessment points. In paired *t*-tests, comparison between two time points was made by deducting the scores of later measurements from the earlier. The tables would show positive mean differences as a decrease in the scores and negative mean differences as an increase. Repeated-measure ANOVA was used to analyze changes between the three assessments if significance occurred in more than one comparison.

To determine the predictability of RSES, CHS, and CMSDS, multiple regression analysis was adopted. Since this analysis was not used to confirm a well-developed model, stepwise regression method was considered.

To determine the mediation effect, the Baron and Kenny (1986) procedure was adopted. These four-step procedures must be satisfied to support the mediation hypothesis. First, the predictor variable (self-esteem, social desirability, and hopefulness) must significantly correlate with the criterion variable (life satisfaction). Second, the predictor variable must significantly correlate with the potential mediating variable (depressive symptoms and subjective happiness). Third, a simultaneous multiple regression analysis must be conducted in which the predictor and mediating variables should significantly account for the variance of the criterion variable. Fourth, the regression coefficient of the predictor variable to the criterion variable should be significantly smaller when there is a mediating variable included than when a mediating variable is not included. Sobel Test (Preacher & Leonarderlli, 2003) would be conducted to test the significance of the mediation effect.

Results

Attendance

Although it was conducted in compulsory lessons of religion and ethics (RE lesson), the absence of students was still recorded. The first two sessions were delivered to the class at full attendance, and there was one absent student recorded in sessions 3 and 4. Their absences were due to sickness and outing for speech contest, respectively. Electronic homework was given to these two students to conceptualize the ideas delivered. During the first assessment, there were two and one students absent in the intervention and control groups, respectively. In the post-intervention and follow-up measurements, there were four students absent, respectively, in each point of assessment.

Assessments

Pre-intervention assessment. At the pre-intervention assessment, independent sample *t*-tests were conducted to determine whether there was any difference between the intervention group and the control group on all study variables. Table 3 shows that there were no differences ($p > 0.05$) between the two groups on CES-D, SHS, E-SWLS, RSES, CHS, and CMSDS at the pre-intervention assessment. These findings suggested sample homogeneity between the two groups.

Post-intervention assessment. Table 3 shows that significant differences were found in the scores of CMSDS between the two groups (t (78) = -2.11, $p < 0.05$), which suggested that the intervention group had lower scores on CMSDS.

Table 3

Comparison of Means for the Six Variables for Intervention and Control Groups at Pre-intervention, Post-intervention and 1-month Follow-up

	Pre-intervention			Post-intervention			One-month follow-up		
	Intervention	Control		Intervention	Control		Intervention	Control	
	M (SD)	M (SD)	*t*	M (SD)	M (SD)	*t*	M (SD)	M (SD)	*t*
CES-D	18.13 (10.10)	18.38 (10.31)	-0.11	19.98 (11.81)	20.23 (10.66)	-0.10	21.10 (10.22)	18.80 (10.30)	0.97
SHS	18.79 (4.24)	18.34 (4.72)	0.45	18.73 (4.34)	18.18 (3.89)	0.59	18.41 (3.49)	18.33 (4.30)	0.00
E-SWLS	47.79 (9.83)	46.56 (12.76)	0.48	48.75 (11.38)	48.36 (11.84)	0.15	50.84 (12.49)	50.85 (11.62)	1.00
RSES	18.13 (4.71)	17.46 (4.65)	0.64	17.08 (5.56)	17.74 (5.00)	-0.56	17.72 (4.98)	17.85 (5.33)	-0.11
CHS	21.85 (4.89)	21.76 (6.33)	0.71	21.15 (6.22)	20.72 (5.67)	0.32	21.10 (5.56)	20.03 (6.28)	0.80
CMSDS	5.41 (1.87)	5.71 (1.78)	-0.73	4.88 (1.62)	5.74 (2.02)	-2.11*	4.77 (2.03)	5.44 (1.92)	-1.49

Note. CES-D: Centre for Epidemiological Studies—Depression Scale; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; RSES: Rosenberg Self-esteem Scale; CHS: Children's Hope Scale; CMSDS: Crowne-Marlowe Social Desirability Scale

* $p < 0.05$

Follow-up assessment. One month after the intervention, a follow-up assessment was conducted to collect data for independent sample *t*-test analysis. Table 3 shows no significant differences between the two groups on all studied variables (p's > 0.05).

Relationships among the Variables in the Study

Table 4 shows that significant correlations (absolute values of Pearson's r ranging from 0.40 to 0.73, $p < 0.05$) have been observed among CES-D, SHS, E-SWLS, RSES, and CHS. There were almost no statistically meaningful correlations observed for CMSDS. Only RSES ($r = 0.40$, $p < 0.05$) and CHS ($r = 0.27$, $p < 0.05$) were found to be moderately associated with CMSDS. For CES-D, the strongest correlation was found to be with RSES ($r = -0.66$, $p < 0.05$), while the rest of the constructs were observed to correlate with CES-D at around $r = -0.50$ ($p < 0.05$). In light of the three concepts of positive psychology, they were observed to be strongly correlated. The strongest products of Pearson's r of SHS were discovered to be with E-SWLS and CHS. Meanwhile, E-SWLS was also found to be strongly correlated with CHS ($r = 0.73$).

Table 4
Pearson's Correlation (r) Table of CES-D, SHS, E-SWLS, RSES, CHS and CMSDS

Variable	1	2	3	4	5	6
1. CES-D	--	-0.47*	-0.43*	-0.66*	-0.51*	-0.22
2. SHS		--	0.51*	0.40*	0.52*	0.13
3. E-SWLS			--	0.55*	0.73*	0.17
4. RSES				--	0.69*	0.40*
5. CHS					--	0.27*
6. CMSDS						--

Note. CES-D: Centre for Epidemiological Studies—Depression Scale; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; RSES: Rosenberg Self-esteem Scale; CMSDS: Crowne-Marlowe Social Desirability Scale; CHS: Children's Hope Scale
*$p < 0.05$

Hypothesis 1: Testing the Outcome of the Positive Program

To answer Hypothesis 1, it was found that the intervention group had a significantly lower CMSDS immediately after the intervention than the control group.

The results of repeated measure *t*-tests and ANOVA comparing the intervention group between pre- and post-intervention assessments showed that CMSDS was significantly lower immediately after the intervention (see Tables 5 & 7).

Table 5
Comparison of Mean Differences of the Six Variables in the Intervention Group in Pre-intervention, Post-intervention and 1-month Follow-up Period

(Intervention Group)	Pre vs Post		Post vs Follow-up		Pre vs Follow-up	
Variables	M Diff (SD)	*t*	M Diff (SD)	*t*	M Diff (SD)	*t*
CES-D	-2.08 (9.59)	-1.32	-0.53 (9.56)	-0.34	-2.72 (9.36)	-1.75
SHS	-0.53 (4.19)	-0.08	0.13 (3.05)	0.27	0.03 (3.38)	0.05
E-SWLS	-2.08 (9.59)	-1.00	-1.87 (7.40)	-1.53	-3.25 (9.15)	-2.13*
RSES	1.00 (5.97)	1.03	-0.95 (5.56)	-1.05	0.16 (3.92)	0.25
CHS	0.47 (4.48)	0.65	-0.08 (4.86)	-0.10	0.32 (3.7)	0.53
CMSDS	0.55 (1.54)	2.22*	0.05 (1.51)	0.22	0.70 (2.08)	2.06*

Note. M Diff: mean difference; CES-D: Centre for Epidemiological Studies—Depression Scale; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; RSES: Rosenberg Self-esteem Scale; CMSDS: Crowne-Marlowe Social Desirability Scale; CHS: Children's Hope Scale
*$p < 0.05$

Paired t-tests for the intervention group. When comparing pre- and post-intervention assessments, the intervention group was found to have a relatively lower mean of CMSDS in the post-intervention (t (37) = 2.22, $p < 0.05$) than in the pre-intervention stage (see Table 5). There were no differences between the comparison of variables in the post-intervention and follow-up assessments. When comparing the pre-intervention and follow-up assessments, sufficient ground was found to show that E-SWLS was higher in the follow-up period than in the pre-intervention level (t (35) = -2.13, $p < 0.05$). CMSDS was also found to be lower in the follow-up assessment (t (36) = 2.06, $p < 0.05$).

Table 6
Comparison of Mean Differences of the Six Variables in the Control Group in Pre-intervention, Post-intervention and 1-month Follow-up Period

(Control Group)	Pre vs Post		Post vs Follow-up		Pre vs Follow-up	
Variables	M Diff (SD)	*t*	M Diff (SD)	*t*	M Diff (SD)	*t*
CES-D	-1.73 (10.80)	-0.97	0.65 (5.99)	0.66	0.76 (7.17)	0.64
SHS	0.24 (4.05)	0.36	-0.08 (2.68)	-0.18	-0.13 (3.22)	-0.25
E-SWLS	-1.90 (10.02)	-1.17	-2.78 (7.19)	-2.36	-4.69 (9.62)	-3.05*
RSES	-0.24 (4.00)	-0.37	0.14 (4.44)	0.19	-0.67 (4.59)	-0.91
CHS	0.90 (4.85)	1.14	0.46 (3.69)	0.76	1.49 (6.13)	1.52
CMSDS	-0.08 (1.89)	-0.26	0.53 (2.10)	1.51	0.39 (1.17)	2.07*

Note. M Diff: Mean difference; CES-D: Centre for Epidemiological Studies—Depression Scale; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; RSES: Rosenberg Self-esteem Scale; CMSDS: Crowne-Marlowe Social Desirability Scale; CHS: Children's Hope Scale
*$p < 0.05$

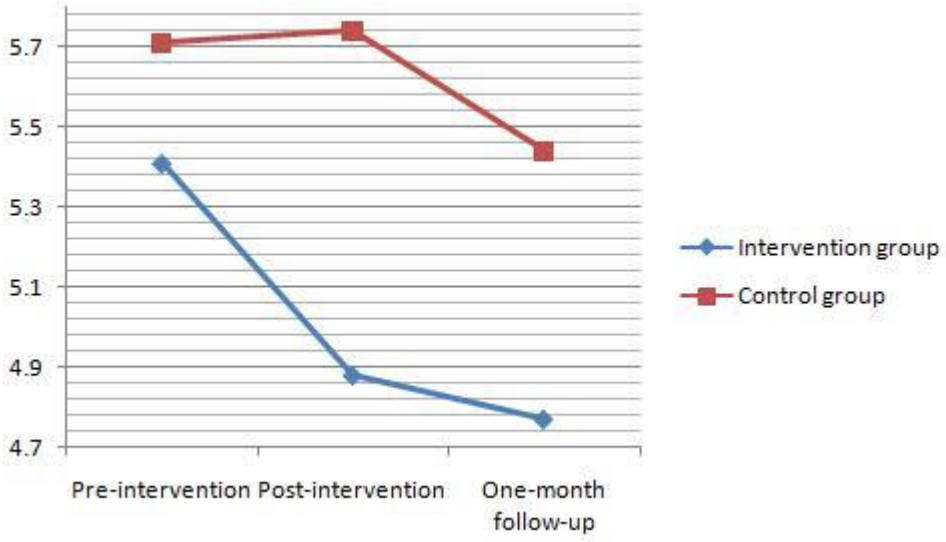
Paired t-tests for control group. In the control group, all variables were found to have no differences in the pre- and post-intervention assessments (see Table 6). There was also no significant discrepancy for all variables between the post-intervention and follow-up assessments. However, statistical significance was found in E-SWLS and CMSDS when comparing their pre-intervention and follow-up conditions. A remarkable increase in E-SWLS (t (38) = -3.05, $p < 0.05$) and a decrease in CMSDS (t (37) = 2.07, $p < 0.05$) were noted.

Table 7
Repeated Measures of CMSDS in the Intervention Group

Source	SS	*df*	MS	*F*
Between treatments	10.89	2	5.44	3.60*
Within treatments	382.03	105		
Between subjects	276.25	35		
Error	105.78	70	1.51	
Total	392.92	107		

Note. CES-D: Centre for Epidemiological Studies—Depression Scale; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; RSES: Rosenberg Self-esteem Scale; CMSDS: Crowne-Marlowe Social Desirability Scale; CHS: Children's Hope Scale
*$p < 0.05$

Figure 2
CMSDS Scores for Intervention and Control Groups at Different Time Points



Repeated-measure ANOVA. To further investigate CMSDS in the intervention group, repeated-measure ANOVA was adopted to analyze their scores in the pre-intervention, post-intervention, and follow-up assessments. The results showed that there were significant differences among the scores from the three stages (F (2, 70) = 3.60, $p < 0.05$; see Table 6). According to the post-hoc tests, there was sufficient evidence that the CMSDS scores in the intervention group were higher at the pre-intervention assessment than at post-intervention ($p = 0.02$) and follow-up ($p = 0.04$). This result indicated significant reduction in CMSDS after the intervention period.

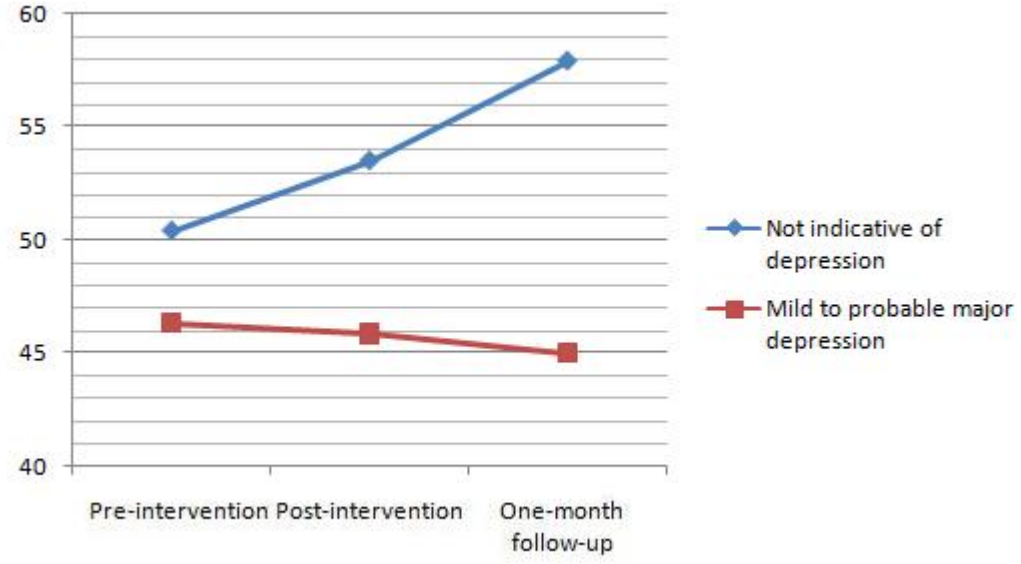
Figure 2 shows that the intervention group underwent an earlier drop of its CMSDS at the post-intervention assessment. At that moment, the CMSDS score in the control group was still higher than that of the intervention group. Although the later reduction of CMSDS was observed in the control group (to the follow-up), the intervention group maintained its lower CMSDS as shown in the graph.

Table 8
Repeated Measures of E-SWLS among the Least Symptomatic in the Intervention Group

Source	SS	*df*	MS	*F*
Between treatments	462.13	2	231.06	6.72*
Within treatments	3732.69	45		
Between subjects	2701.48	15		
Error	1031.21	30	34.37	
Total	4194.81	47		

*$p < 0.05$

Figure 3
E-SWLS Scores for Students in the Intervention Group According to Their Depression Level at Different Time Points



Other findings about the effectiveness of the Positive Program. As the literature suggests, positive measurements like SHS and E-SWLS might be able to reflect the effect of intervention on students with minimal depressive symptoms. In the intervention group, repeated-measure ANOVA was conducted on students regarded as having no depressive symptoms as shown by CES-D. Sixteen students scored less than 15 points in CES-D at the pre-intervention assessment and were included in this test. It was found that there were no significant differences on their SHS (F (2, 32) = 0.67, $p > 0.05$). Table 8 shows statistically meaningful differences on their E-SWLS (F (2, 30) = 6.72, $p < 0.05$). Post-hoc tests indicated that their level of E-SWLS at follow-up (M = 57.94; SD = 11.03) was significantly higher than that

at the baseline (M = 50.38; SD = 7.35). A tendency of improvement in E-SWLS among students with least symptoms was observed (see Figure 3).

Hypothesis 2: Testing the Predictors of SWB

To answer Hypotheses 2a and 2b, three multiple regression models were fitted. RSES, CHS, and CMSDS were adopted as the predictor variables in each model, and CES-D, SHS, and E-SWLS were the criterion variables, respectively.

Table 9
Summary of Stepwise Regression Analysis for Variables Predicting CES-D, SHS and E-SWLS

	Criterion variable	Predictor variable	R^2	*B*	*SE B*	ß
Model 1 (*n* = 77)	CES-D	RSES	0.44*	-1.484	0.193	-0.663
Model 2 (*n* = 80)	E-SWLS	CHS	0.53*	1.471	0.156	0.729
Model 3 (*n* = 80)	SHS	CHS	0.27*	0.412	0.077	0.519

Note. R^2: R square; *B*: unstandardized coefficient; *SE B*: standard error of the coefficient; ß: standardized beta coefficient; CES-D: Centre for Epidemiological Studies—Depression Scale; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; RSES: Rosenberg Self-esteem Scale; CHS: Children's Hope Scale
* $p < 0.05$

Model 1. In the first model (see Table 9), the predictors of CES-D were investigated. Only RSES resulted in a strongly negative relationship with CES-D (ß = -0.663, $p < 0.05$). RSES might be able to explain 44% of the variance of CES-D (R^2 = 0.44).

Model 2. Table 9 presented Model 2 in this study. E-SWLS could be positively predicted by CHS (ß = 0.729, $p < 0.05$). Although only CHS was the predictor to E-SWLS, there was only 47% of the variance of E-SWLS that could not be predicted (R^2 = 0.53). These two constructs were more closely associated.

Model 3. As shown in Table 9, Model 3 results indicate that CHS was the only predictor of SHS. The relationship between CHS and SHS was found to be positive (ß = 0.519, $p < 0.05$). With CHS alone, 27% of the variance of SHS could be explained solely by CHS (R^2 = 0.27). Both of them were constructs in positive psychology. Their relationship could be proved to share some of the same variance.

Hypothesis 3: Testing the Mediating Effects of SHS on the Hopefulness—Life Satisfaction Link

For Steps 1 and 2, Models 2 and 3 satisfied the requirements of the procedures, respectively. In Model 2, CHS could predict a positive relationship of E-SWLS (ß = 0.729, $p < 0.05$) in which 53% ($R^2 = 0.53$) of the construct of E-SWLS could be explained. Table 9 shows that Model 3 indicated that CHS could predict 27% ($R^2 = 0.27$) of the variance of SHS in a fairly positive relationship (ß = 0.519, $p < 0.05$). CES-D, however, has not been found to predict a significant correlation with E-SWLS.

For Step 3, the procedure requires that both the proposed mediating variable (SHS) and the predictor variable (CHS) be in the same multiple regression analysis. We developed Model 4 by adding CES-D and SHS to Model 3. Table 10 shows that it resulted in CHS (ß = 0.634, $p < 0.05$) and SHS (ß = 0.184, $p < 0.05$) being found able to positively predict E-SWLS. Together, they composited a strong prediction of E-SWLS with the cumulative R^2 as 0.56—that is, 56% of the variance of E-SWLS were explained by these two constructs simultaneously. Only 45% of the variance of E-SWLS could not be accounted for by the model constituted by CHS and SHS.

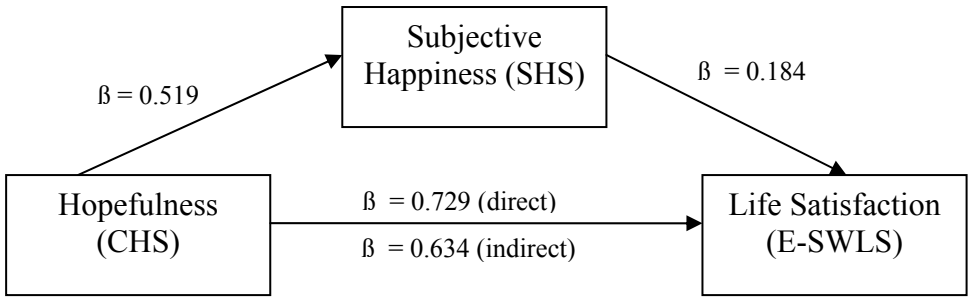
Table 10
Summary of Enter Regression Analysis for Variables Predicting E-SWLS-Model 4 (n = 77)

Criterion variable	Predictor variable	*B*	*SE B*	ß
E-SWLS	CHS	1.279	0.179	0.634
E-SWLS	SHS	0.467	0.226	0.184

$R^2 = 0.56$ ($p < 0.05$)

Note. R^2: R square; *B*: unstandardized coefficient; *SE B*: standard error of the coefficient; ß: standardized beta coefficient; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; CHS: Children's Hope Scale

Figure 4
Standardized Beta Coefficient in Subjective Happiness Mediated Pathway from Hopefulness to Life Satisfaction



Note. ß: standardized beta coefficient; SHS: Subjective Happiness Scale; E-SWLS: Expanded Satisfaction with Life Scale; CHS: Children's Hope Scale

In Step 4, whether there is a mediation effect depends on the reduction of the regression coefficient for the predictor variable from Steps 1 to 3. There is a partial mediation effect because the ß coefficient of CHS was reduced partly from 0.729 to 0.634. A Sobel Test was conducted, and it was found that $z = 1.93$, $p = 0.05$. The mediation effect was marginally significant. In this study, SHS might represent a fair portion of the mediating effect in the relationship between CHS and E-SWLS (see Figure 4). The partial mediation effect accounted for the 0.095 value of beta, which suggested that 13% of the effect of CHS on E-SWLS went through SHS, and that 87% of the effect was direct.

In summary, the relationships addressed in Hypothesis 3 were partly upheld. RSES was found to be a strong predictor for CES-D, while the three constructs in positive psychology—SHS, E-SWLS, and CHS—were intercorrelated. Multiple regressions were adopted to test the mediating effect of SHS in the relationship between CHS and E-SWLS in accordance with the procedures documented by Baron and Kenny (1986) that a marginally significant mediating effect can be found. Nonetheless, CMSDS was not found to have any sufficient relationships with the constructs in SWB.

Discussion

The aim of this paper was to explore the insufficiently studied problem of the effectiveness of a depression prevention program with positive psychology components. It specifically designed a prevention program with positive psychology concepts, implemented it in a sample of adolescents, and assessed its effectiveness. It was found that social desirability was not strongly correlated with depression, happiness, and life satisfaction. Consistently, participants had no improvement in all three SWB measures although their social desirability was found to be lower after the Positive Program. As for prediction, self-esteem was found to be a significant predictor for depression. Meanwhile, hopefulness was found to be associated with happiness and life satisfaction. The mediation effect of happiness was found in the link between hopefulness and life satisfaction. These findings implied significant variables in relation to formulating a depression prevention program.

This study investigated correlations among variables. Consistent with previous literature, depressive symptoms were negatively correlated with all positive psychology constructs (subjective happiness, life satisfaction, and hopefulness). Among all variables, the strongest relationship was found between hopefulness and life satisfaction ($r = 0.73$, $p < 0.05$). It was consistent with postulates in positive psychology and might have been because they are both cognitive constructs.

Self-esteem, nevertheless, was found to have the strongest correlation with depression ($r = -0.66$, $p < 0.05$), while social desirability was found to be indifferent to depressive symptoms ($r = -0.22$, $p > 0.05$). This is different from what previous literature suggested. Suh (2002) reported a stronger correlation between social desirability and depressive symptoms in Korean samples. Under colonial influence, Hong Kong might be an “atypical” Chinese city (Stewart et al., 2004). Similar to

Western culture, self-esteem might be more correlated with depressive disorder in the territory.

Social desirability only correlated with self-esteem ($r = 0.40$, $p < 0.05$) and hopefulness ($r = 0.27$, $p < 0.05$). These findings might suggest that presenting oneself favorably is related to one's own self-esteem and hope. However, the reliability of CMSDS in this study was unsatisfactory. Further research could investigate these relationships.

Based on Hypothesis 1, enhancing self-esteem and hopefulness, and reducing social desirability were regarded as the strategies of the Positive Program to prevent adolescent depression by boosting one's SWB. During the study from pre-intervention to follow-up, both intervention and control groups reported a decrease in social desirability (in intervention group, t (36) = 2.06, $p < 0.05$; in control group, t (37) = 2.07, $p < 0.05$) and an increase in life satisfaction (in intervention group, t (36) = -2.13, $p < 0.05$; in control group, t (38) = -3.05, $p < 0.05$). It is possible that students had a gradual reduction in social desirability because of the increase in familiarity and friendship after school starts. Given the insignificant correlation between social desirability and life satisfaction, an increase in life satisfaction might be attributed to the timing of the follow-up assessment after the examination period. With less study pressure, students might possibly be more positive about their own lives and their relationships with family members.

Only the intervention group reported a significant attenuation in social desirability in post-intervention (t (37) = 2.22, $p < 0.05$). Repeated-measure ANOVA resulted in a significantly lower social desirability of the intervention group in post-intervention and follow-up than in pre-intervention (F (2, 70) = 3.60, $p < 0.05$). The Positive Program might have helped participants reduce their desire to present

themselves favorably for positive social appraisal, that is, their defensiveness (Beck, Coffey, Palyo, Gudmundsdottir, Miller, & Colder, 2004). They might be more able to accept themselves instead of telling lies (Johnson Fendrich & Hubbell, 2002).

It might be reasonable to believe that the Positive Program addressed the cultural issues in that it might have reduced the behavior of presenting oneself favorably. Still, the scores in CES-D did not show any significant change. Lowering defensiveness seemed not to influence depression and SWB.

There were no significant changes (p's > 0.05) in self-esteem and hopefulness in any repeated-measure analyses. These two prevention components might be rather stable. Diener (1984) proposed the mental process of social comparison in building up one's own perception and suggested the long duration of the development. Lopez et al. (2003) also explained that hope is an enduring process of mental development. Given the time constraint imposed by the school, it is possible that self-esteem and hope were not affected.

For students with minimal depressive symptoms, there was a significant difference in their life satisfaction scores between pre-intervention and follow-up assessments. Positive psychology suggested that measurements for subjective happiness and life satisfaction help detect the effects that a prevention program might have on a least symptomatic student. Although the sample size was not large (n = 16), the present findings noted that the life satisfaction of the least depressed among the intervention group went up after the intervention (F (2, 30) = 6.72, p < 0.05). It suggested that E-SWLS might be helpful in notifying the prevention effect. In the present study, the version documented in Ho and Cheung (2007) was able to capture life satisfaction in interpersonal domain. The effect of the Positive Program that reduced social desirability of the participants might have also influenced their

interpersonal life satisfaction. The failure of SHS to detect the same change might be explained by its sensitivity. The current finding is only suggestive at best and requires further research.

Overall, there were only protective factors in the Positive Program. Gillham and colleagues (2000), nevertheless, pinpointed that the risk reduction approach was highly recommended in which risk factors should be considered in program formulation. The present study operationalized only protective factors, while risk factors were not adequately emphasized. This was consistent with Gillham's prediction that programs formulated by protective factors might not be as effective as both risk and resilience factors. Indeed, the prevention formula of Meyers and Meyers (2003) hypothesized that a prevention program should aim to reduce vulnerabilities and enhance resources, like SWB. However, under suggestions by Gillham and Meyers, it seemed that it would be difficult to isolate protective factors that would have the same results. In practice, to have an effective prevention program, this study would need to incorporate risk and resilience factors into a program. This study also highlighted the difficulty of studying protective factors only.

Self-esteem was found to be the only significant predictor of depressive symptoms (ß = -0.663, $p < 0.05$). It was consistent with Western literature that self-esteem was strongly associated with depression (Cicchetti & Toth, 2005). Even in Eastern Europe, self-esteem was a strong predictor of depression among teenagers (Piko & Fitzpatrick, 2003). It is generally believed that low self-esteem is one of the risk factors of depression, and high self-esteem might help promote resilience against depression (Franken, 2007). This also seemed to apply in this study. It might be because of the unique culture of Hong Kong that it is regarded as an "atypical" city of China (Stewart et al., 2004). Self-esteem seems to weigh more in studying depression

and SWB in the territory as it has a special cultural difference from other Chinese cities. It is important that high self-esteem, as a resilience factor, might be worth considering when designing a prevention program.

Social desirability was not associated with depression in this study. Joiner Jr. (2001) found that defensiveness could be associated with depression. Suh (2002) found that seeking social appraisal could predict life satisfaction and positive affect. When studying SWB, the predictability of self-esteem was often believed to be less salient than that of social acceptance in collectivistic subjects (Suh, 2002; Russell, Crockett, Shen & Lee, 2008). Ho and Cheung (2007) also considered interpersonal elements in designing their culture-specific assessment tool. However, the present findings on social desirability and self-esteem might be dissonant to these previous studies. In this research, self-esteem was found to be the strongest predictor of depression, while social desirability was not found to predict any constructs of SWB. The reliability of the result might be affected by the Cronbach's alpha of 0.33 in CMSDS. For convenience of administration, short-form CMSDS (Strahan & Gerbasi, 1972) was adopted. There were 10 questions in the short form, and the sample of adolescents might have influenced the reliability of the measure.

Hope was a significant predictor to both happiness (ß = 0.519, $p < 0.05$) and life satisfaction (ß = 0.729, $p < 0.05$). This finding was partly consistent with the framework suggested by Meyers and Meyers (2003) that hopefulness should be a component of prevention programs to enhance SWB. Hope was found to be related to competence and self-worth (Snyder et al., 1997). By helping adolescents build up hope through forming attainable goals and setting possible pathways, students might be able to perceive themselves as competent. This could enhance their self-worth and consequently, their life satisfaction and happiness.

However, hopefulness was not significantly associated with depression in the current study. Its indifference to depression was inconsistent with what Snyder et al. (2003) suggested that children with lower hope had more depressive episodes. The current findings might have been biased by its small sample size. Further investigation into the constructs of hopefulness and depression is strongly encouraged.

Happiness was found to be a mediator in the link between hopefulness and life satisfaction. It explained 13% of the effect of hopefulness on life satisfaction (Sobel Test: $z = 1.93$, $p = 0.05$). The marginal significance might be because of the new scale of life satisfaction. E-SWLS included life satisfaction in the interpersonal domain, which is different from the original SWLS (Ho & Cheung, 2007). SHS might not be able to explain the variance in the interpersonal relationship which E-SWLS concerns. There might be more significance if the original SWLS, which concerns merely intrapersonal satisfaction, was adopted.

Notwithstanding, this study could suggest a framework for positive psychology. In terms of an affect-cognitive priming model, enhancing hopefulness and increasing happiness might boost life satisfaction directly as an affective component to influence life satisfaction, which is regarded as a cognitive component in our motivation (Wheeler & Miyake, 1992). This finding is consistent with what Schimmack et al. (2002) found. To formulate a prevention program, building up hope among adolescents might contribute to a happier and more satisfying life experience.

Limitations

This study is not without limitations. The sensitivity of the measurements adopted in this study could undermine the results. Measurements might be more accurate if they could indicate whether they are related to state and trait. There has been both trait and state assessments for the construct of anxiety, such as the State-

Trait Anxiety Inventory (Spielberger, 1983). Unlike anxiety, most of the constructs used in this study were ambiguous in their relationship to trait or state. Well-documented assessments were often trait oriented, like RSES (Heatherton & Wyland, 2003). Particularly for assessments in positive psychology, they are still in their infancy, and it might be still room to investigate their trait-state status. As guidance for further studies on this Positive Program, state measurements would be appropriate. A state approach might provide higher sensitivity to changes in variables (Diener et al., 1997) in which it might facilitate the measurement of transitory emotional conditions.

In this sense, the nature of the assessment is also vital in interpreting the score of CMSDS. The significant difference, in spite of effective intervention, might be due to the sensitivity of the scale. There was a great need for a multivariate study of measurement scales in parameter estimates. Like Dumenci and Windle (1996), CES-D was found to measure both trait-specific and state-specific symptoms of depression equally. Perhaps, this kind of study could help validate the use of such an assessment in an appropriate setting; after all, assessment is always an important practice in psychology. The present program formulation might benefit if a trait-state nature of assessment tools was specified.

Although there is limited time available, intervention programs are not strange in the education system in Hong Kong. However, the time constraint was detrimental to the effectiveness of the Positive Program. Brief sessions/therapies are often questionable in their effectiveness. Gillham et al. (2000) expressed their "disappointment" in reviewing two short programs. Short contact hours might hinder the dissemination of effective intervention. Indeed, cognitive-behavioral therapy might take longer to be in effect and be sustained as compared to experiential

techniques. This is why the experiential “first-aid” services provided by hotline counselors, like befriending techniques by the Samaritans, are popular as emotion-focused conversation helps relieve distress. It is no surprise that social desirability sessions consisting of experiential activities in this Positive Program came to effect as soon as the immediate assessment could detect them.

Besides the effectiveness of the program on issues about defensiveness, dissemination of the prevention effect was greatly impeded by time restriction. Since the rushed schedule of secondary schools in Hong Kong and academic success outranked the importance of mental health, the resources allowed for the program were unfavorable. Not only did short contact hours matter, but the large size of the class also retarded the progress of the Positive Program. Notwithstanding, this was the reality of the education system in the territory. Creating favorable circumstances might in turn hurt the external validity or generalization of the program proposed, while this research aimed at gathering information for practical program formulation.

Despite time constraints, the sample was chosen by the collaborating secondary school. This might raise the possibility of sample bias. The sample was from two classes. Students of the intervention group came from the same class, while those in the control group were from another. Systematic bias, like the sense of belonging, inevitably influenced the result of the study. Moreover, there might be stigmatization when the sample arranged by the school was from the class “at the bottom” of the form. Students were viewed as lazy and moody. Their self-perception might have also assimilated labeling from their teachers and peers. Students might have felt stigmatized when they had to join this program. This led to resistance which might have dismantled some of the effects of the Positive Program.

To summarize, the results of the study support the suggestions by positive psychology. First, measuring only the depressive symptoms might not show the effect of a prevention program. Meanwhile, measuring happiness and life satisfaction might help measure the effect on students with minimal symptoms. Second, despite the significance of self-esteem, hopefulness was strongly correlated with happiness and life satisfaction. Building up hope among adolescents might help enhance their happiness and life satisfaction as a buffer for depression. Finally, although social desirability failed to support its effect in a prevention program, it should be noted that the current scale could be more reliable. Further studies could provide more information in considering the reduction of social desirability as a protective factor in depression prevention.

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