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The Importance of the Buddhist Teaching on Three Kinds of Knowing
In a School-Based Contemplative Education Program

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Abstract

This research attempts to determine whether a supplementary school-based contemplative education program, the Orientation to Life Program (OLP), can enhance students' psychological well-being and ability to handle stress. 481 Hong Kong students were divided into: experimental group that studied Religious Studies (Buddhism) (RSB) and participated in the OLP, control group I that took the RSB but not the OLP, and control group II that took neither the RSB nor the OLP. Result indicated that students' ability to handle stress as measured by their sense of coherence (SOC) was correlated to their psychological well-being as measured by General Health Questionnaire (GHQ) and Self Esteem Scale (SES).

The data also showed that the OLP was only able to enhance a sub-group students' ability to handle stress, while failing to do so with the whole experimental group. The shortfall of the program could come from not being able to become a part of the normal school curriculum with regular class time and authority to assign regular homework.

Furthermore, the findings showed that the Buddhist Teaching on the three kinds of knowing (i.e. wisdom consisting of learning, wisdom produced by thinking and wisdom realized by practice) was important and the three wisdoms seemed to be correlated and interdependent. Future programs that aim at enhancing students' ability to handle stress and psychological well-being should consider including both theoretic teachings and experiential workshops in their design.

Keywords: stress; contemplative education; Buddhism; adolescence; sense of coherence; self-esteem; Buddhist education; Buddhist teaching on the three kinds of knowing.

Introduction

For nearly everyone in Hong Kong, life is busy, demanding and stressful. This reality also applies to adolescents studying in Hong Kong's high schools. Although some statistics suggest that the overall psychological well-being of these youngsters appears to be doing well, other statistics indicate otherwise. For example, the percentage of primary school students deemed to have self-esteem problems dropped from 6% in 1999 to 3.1% in 2005 but the number of youngsters between the ages of 0 - 14 years seeking psychiatric help from government hospitals increased from 14,348 in the year 2001 to 18,516 in 2005 --- an increase of close to 30% (Law, 2006). In other research conducted by the Department of Community Medicine of the University of Hong Kong pointed out that the psychosocial and behavioral health of primary and secondary students in Hong Kong "might be worrying"¹ (Wong, 2005). From these reports, it would seem that more research is needed to better understand Hong Kong students' psychological well-being and to explore ways to help them to better deal with the ever increasing stressful environment.

In the year 2000, the Hong Kong Government's Education Commission published a reform report -- *Learning for Life, Learning Through Life - Reform Proposals for the Education System in Hong Kong* (Education Commission, 2000). In it there is the provision of "a broad senior secondary curriculum to enable students to acquire experiences in various key learning areas, construct a broad knowledge base, and enhance their ability to analyze problems" (Education Commission, 2000). This new emphasis on learning for life and the whole-person emphasis to education opened an opportunity for us to approach Hong Kong's schools and suggest to them programs that could address the psychological well-being of students.

On top of this, in the year 2003, there was the launching of the new Religious Studies (Buddhism) syllabus (RSB) in the Hong Kong Certificate of Education Examination. In this new syllabus, apart from the normal curriculum on Buddhist history, Buddha Teachings and related scriptures, there is a new section on the application of Buddhist Teachings in daily life. Based on this new section, and as a form of contemplative education, we designed 20 workshops that would become a school-based life education program for enhancing student's ability to handle stress, namely "Orientation to Life Program".

¹ The report found that 12% of primary and 21.7% of secondary students reported some levels of deliberate self-harm; 17.6% and 3.7% of primary students, and 27.3% and 5.1% of secondary students, respectively, ever had suicidal ideation and attempt.

This paper reports the development, implementation and evaluation of the pilot study of Orientation to Life Program for enhancing adolescents' ability to handle stress.

Conceptual Framework of the Intervention: Orientation to Life Program

The conceptual framework of the Orientation to Life Program (OLP) is built on two concepts: the concept of sense of coherence (SOC) developed by Aaron Antonovsky (Antonovsky, 1987) and the concept of "Life Education Based on the Concept of Dependent Origination" (LEDO) developed by Sik Hin Hung (Sik, 2003). In addition, the messages and contents of the program were packaged and disseminated as according to the concept of contemplative education so that the program would become more interesting and interactive for high school students.

In the following, the three concepts would be discussed in more detail:

I. Sense of Coherence

In recent years, the concept of sense of coherence (SOC) (Antonovsky, 1987) as both a measure of stress and a resource in coping with stressful life experiences has generated considerable interest (Torsheim, Aaroe et al., 2001). Antonovsky proposed that SOC, which he defined as "a global orientation to view life situations as comprehensible, manageable and meaningful", may influence a person's ability to handle stress and health in three ways: (1) whether a stimulus is appraised as a stressor or not; (2) the extent to which a stressor leads to tension or not; and (3) the extent to which tension leads to adverse health consequences (Antonovsky, 1987).

Since Antonovsky first presented the concept of SOC in 1979, a great number of studies utilizing SOC as a possible determinant of health have been published. In a systematic review and analysis of the validity and reliability of the SOC scale, it is found that the SOC scale "seems to be a reliable, valid, and cross culturally applicable instrument measuring how people manage stressful situations and stay well" (Eriksson and Lindstrom, 2005). Furthermore, many studies have found that SOC seems to be strongly linked to both physical and mental health outcomes independent of other types of exposure (Bengel, Strittmatter et al., 1999; Suominen, Helenius et al., 2001; Atroshi, Andersson et al., 2002; Savolainen, Suominen-Taipale et al., 2005).

According to Antonovsky, SOC is a developmental construct that "becomes more or less

fixed” in a person’s early adulthood. He postulated that “the adolescent, at the very best can only have gained a tentative strong SOC which may be useful for short-range prediction about coping with stressors and health status” (Antonovsky, 1987, p. 107). Several studies, however, have shown that an adolescent’s SOC may contribute to stress and coping in much the same way as does that of adults (Antonovsky and Sagy, 1986; Margalit and Efrati, 1996; Baker, 1998). Furthermore, studies have shown that it may be possible to enhance a person SOC through various forms of interventions. For example, Nakamura from Kanazawa University “demonstrated that an increase in SOC was seen in workers who improved the exercise habit after the health education” (Nakamura, Matsuzaki et al., 2003). Delbar and Benor from Israel showed that SOC scores of cancer patients that participated in a structured nursing intervention “indicated significant improvement in all three SOC subcategories (namely comprehensibility, manageability and meaningfulness) and that their locus of control became significantly more internal, although the external subscale was unaffected” (Delbar and Benor, 2001). While studying the capacity of SOC to buffer the effect of illness symptoms and psychological distress among patients with fibromyalgia, Weissbecker and others also examined the self-reported changes in SOC after participation in a Mindfulness-Based Stress Reduction (MBSR) program. They concluded that the result of their randomized trial provided the first demonstration that SOC may be enhanced via intervention (Weissbecker, Salmon et al., 2002).

Given these important and relevant literatures on SOC, as well as its reliability and validity, we decided to structure the OLP as according to the three subcategories of SOC, i.e. comprehensibility, manageability and meaningfulness, so that students’ sense of coherence and ability to handle stress could be enhanced while taking part in the program.

II. “Life Education Based on the Concept of Dependent Origination (LEDO)”

We incorporated the theory and teachings of “Life Education Based on the Concept of Dependent Origination (LEDO)” developed by Sik Hin Hung (Sik, 2003) into the program so as to give structure and direction to the content of OLP. The Law of Dependent Origination is the core of Buddha’s teachings. Basically, the law says that all phenomena arise from a coalescence of causes and conditions. For example, an apple emerges only from the coalescence of apple seed (the cause) and soil, water, air, sunshine, etc. (the conditions). Without the seed, there can be no apple. At the same time, an apple seed can only lead to the emergence of apples. Furthermore, without the supporting conditions, a seed would not be able to produce any fruit.

According to the Buddha, the Law of Dependent Origination does not just explain how things come to be. It also makes clear how people and sentient beings come into existence and function. Like a seed, a person's mind is the cause and/or the chief that determines his or her future, and the body and living environment are the supporting conditions for existence. If a person's mind is pure and peaceful, he or she will reap the fruit of happiness and peace. If a person's mind is ignorant and deluded, he or she will experience helplessness and anguish.

One of the important characteristics of the ostensibly simple Law of Dependent Origination, as proclaimed by the Buddha, is its truthfulness and universality. Hence, an education program based on Dependent Origination could induce and lead students to understand life clearly and see the reality of the world. The following is the core teachings of the LEDO:

The Core Teachings of "Life Education Based on the Concept of Dependent Origination"

➤ ***Comprehending Life***

From seeing how life originates from the coalescence of causes and conditions, we see that there is no "real me" that is inherently good or bad, pitiful or admirable. When the causes and conditions change, the "self" changes accordingly. Because of the absence of a fixed "real me" there are endless opportunities.

From seeing how life originates from the coalescence of causes and conditions, we see that there is a direct relationship between cause and effect. An apple's seed will only give rise to an apple tree. A person with a pure mind that lives mindfully will have a happy life. On the other hand, a person that is unmindful and deluded will suffer. Our minds lead and direct our lives.

➤ ***Finding Meanings in Life***

From seeing how life originates from the coalescence of causes and conditions, we should learn to appreciate and treasure the miraculous wonder of life and how life comes to be.

From seeing how life originates from the coalescence of causes and conditions, we should be grateful and develop gratitude toward all of the causes and conditions that facilitate and support our existence.

From seeing how life originates from the coalescence of causes and conditions, we should learn to treasure and make the best out of what we have now because they will fade away when the conditions change. At the same time, we should also learn to let go of what we have, because they will fade away no matter what.

From seeing how life originates from the coalescence of causes and conditions, we see the interdependency of all causes and conditions, and how we are all interconnected. Therefore, we should learn to cooperate, to share and to be benevolent.

➤ *Managing Life*

In order to nourish the good seeds that lead to happiness and weed out the bad conditions that lead to suffering, we have to live a life that is disciplined and measured. Furthermore, as a matter of principle, "do not do to others what you do not want done to yourself."

In order to accomplish our goals in life, we should learn to develop patience, concentration and determination.

To manage life skillfully, we need wisdom to decide which directions are correct and beneficial, and what methods are right and skillful. In order to develop these wisdoms, we need to be learn extensively, reflect frequently and practice mindfulness diligently.

The last point of the above core teachings, that is: a person's wisdom and intelligence could be enhanced and developed by (1) learning extensively, (2) reflecting frequently and (3) practicing mindfulness diligently is actually a graduated path taught by the Buddha. They are sometimes called "three kinds of knowing". In the important Mahayana text: *Sandhinirmochana Sutra* (Cleary, 1995, p.55), they are referred as:

1. Wisdom consisting of learning (聞所成慧)
2. Wisdom produced by thinking (思所成慧)
3. Wisdom realized by practice (修所成慧)

III. Contemplative Education

Contemplative education is a philosophy of education that infuses learning with the practice of meditation and contemplative activities, such as ikebana, yoga and Chinese

brushstroke to facilitate a deeper level of awareness, insight and compassion for oneself and others. It was first promoted at Naropa University (Boulder, Colorado) founded by Chögyam Trungpa, Rinpoche in 1974. Since then, the possibility of integrating contemplative practices and education has gained considerable interest in America during the past decade.

In 1996, the American Council of Learned Societies and the Centre for Contemplative Mind in Society partnered to offer fellowships “to develop courses in various academic disciplines that would integrate contemplative practices”. At the time, they were able to select 16 fellows from among the 100 applications. By 2006, the program was offering 120 fellowships in 80 colleges and universities throughout America (Hill, Sept 2006, 1721). The motive behind the launching of the project was to find out “could a contemplative way of knowing complement the rational, scientific way on which the academy is based? Could students become deeply engaged with new ways of knowing and learning that address the urgent issues of our time? Could students and teachers together develop a more compassionate understanding of the behavior and values of others?” (Hill, Sept 2006, 1721)

In 2005, a conference on contemplative practices and education was held at the Teachers College, Columbia University. Educators from across America and other part of the world attended. At a result of the conference, the *Teachers College Record*, a leading journal in the field of education, published a special issue on the papers presented at the conference.

Despite the increasing popularity of contemplative education, however, there have been very few researches done on its effectiveness as a form of education and as program of intervention. As already stated, the design of the current project’s program of intervention would incorporate the teaching philosophy of contemplative education. Therefore, we hope the current project would serve as a starting point and a pilot study to shed some light on the effectiveness of contemplative education.

Research Methods

Design:

A quasi-experimental pretest-posttest control group design was used in this study. The participating schools preferred to assign and select the classes that would join the OLP by their own deliberations, so randomization was not feasible for this study.

Objective:

Based on the rationale of the above discussion, the objective of this research project was to test the following hypotheses:

- (1) A student's SOC score is related to his/her overall psychological well-being;
- (2) Students that participate in the OLP of workshops would show a positive and significant difference in the magnitude of change in their SOC scores when compared with students not participating in the contemplative workshops;
- (3) Knowledge and practice are both important in order to make an impact on the students' ability to handle stress.

The School-based Contemplative Program

The school-based contemplative program OLP is structured to enhance the comprehensibility, manageability and meaningfulness of the students and its theoretic foundation is based on the theory of "Life Education Based on the Concept of Dependent Origination (LEDO)". The program included 18 ninety minutes workshops, 2 half-day inter-school workshops and three special activities. The workshops were mainly carried out on the campus of the participating schools as extracurricular activities. They were normally held once every 2 to 3 weeks. The three special activities included a visit to residential homes for mentally retarded people, a visit to a school in a mountainous and poor area in China, and a "life release" launch to save the lives of fish that were destined to be killed.

With the core teachings of LEDO as the theoretical background, the content of the 20 workshops were also divided into three stages as according to the graduated path of Buddhist teachings. The first stage concentrated on introducing the working of the law of karma and how to attain worldly happiness for this life and the next. The second stage concentrated on the teaching of the Four Noble Truths and how to attain true freedom and peace of mind. The last stage focused on the development of compassion and how to help others to attain happiness, freedom and peace of mind.

Various interactive teaching formats were used in the workshops to stimulate and sustain student's interest, i.e. mini-lecture, video presentation, class and/or group discussion, game, simulation, exercise, role-play, drama and visits to monasteries. Mindful breathing meditative exercises were introduced at the beginning of the second stage of these

workshops and practiced together for about 15 minutes at the beginning of all subsequent workshops.

Subjects:

Between September 2004 and December 2005, 614 Form four students from 15 classes that came from 10 Hong Kong secondary schools were recruited. Out of the ten schools, five were Buddhist denominated schools that shown an interest to participate in the project. The other five non-Buddhist schools were selected because their students had similar academic standard and social-economic backgrounds to the five Buddhist schools. The 15 classes were nominated by the relevant schools.

There were three different groups: an experimental group (5 classes which came from 5 Buddhist schools), a control group I (5 classes which came from the same Buddhist schools of the experimental group), and a control group II (5 classes which came from the non-Buddhist schools which did not offer the subject Religious Studies (Buddhism) syllabus (RSB)) as shown in the Table 1. The experimental group studied the Religious Studies (Buddhism) syllabus (RSB) and participated in the OLP, the control group I studied the RSB only, and the control group II did not attend the RSB or the contemplative education workshops.

Table 1: Definitions of the types of subject groups in the study:

<i>Three types of groups</i>	<i>Characteristics</i>	<i>Where from</i>
Experimental group (five classes)	Studied the Religious Studies (Buddhism) syllabus (RSB) and participated in the OLP	1 class from each of the 5 Buddhist schools
Control group I (five classes)	Studied the RSB only	1 class from each of the 5 Buddhist schools
Control group II (five classes)	Did not attend the RSB or the OLP	1 class from each of the 5 non-Buddhist schools

There were 199, 205 and 210 students in the experimental group, control group I and control group II respectively. A total of 614 and 577 questionnaires were collected in the pretest and the posttest respectively. A few questionnaires with non-responses in the measures were discarded. On top of this, those students in the experimental group and

control group I who had dropped the subject RSB were also excluded for analysis. Besides, only data from those students who had participated in both pre and post tests and were promoted to Form five were included for analysis. The number of dropouts from the experimental group, control group I and control group II were 55, 56 and 22 respectively. After cleaning up the aggregated data set, the valid sample in this study was 481 respondents including 144 in the experimental group, 149 in the control group I and 188 in the control group II (Figure 1).

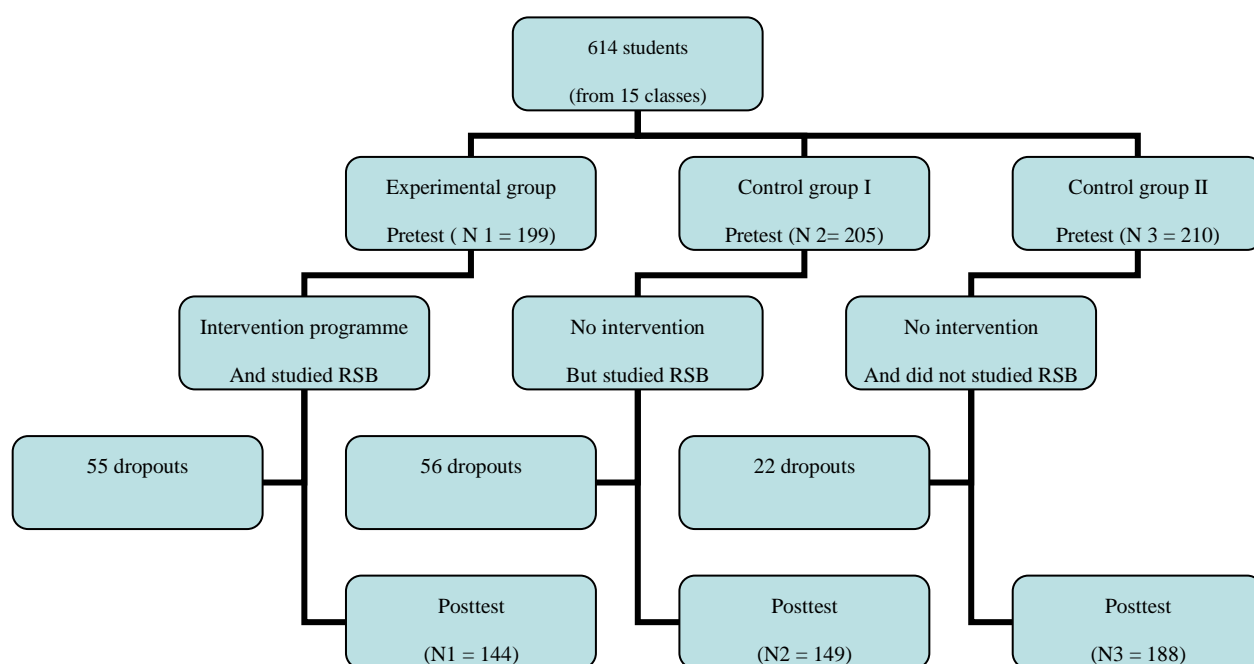


Figure 1 The flow chart of inclusion of study subjects

All experimental activities were conducted by the project leader with three assistants. During the pretest, demographic and family information were collected in the form of a questionnaire from the students. In the posttest, the demographic and family questionnaire was amended to include asking respondents about possible changes in their religion and parent’s marital and/or work status. For the experimental group, one additional section of questions was added to ask the students whether they perceived any improvement in their SOC after participating in the contemplative education program. Final mock examination grades of those students who took the RSB were also collected from the school authorities.

The overall psychological well-being of the students was measured by using the General Health Questionnaire (GHQ)(Shek, 1989) and the Self-Esteem Scale (SES)(Rosenberg, 1965). Three questionnaires were used as the measure of outcomes in this study, namely the “Orientation to Life” Questionnaire to measure the SOC, the General Health Questionnaire (GHQ) and the Self-Esteem Scale (SES). The details of measures were as follows:

Measures

The short Chinese version of the Orientation to Life Questionnaire (SOC-13) (Antonovsky, 1987) was used in this study as the primary outcome measure to assess student’s ability to handle stress. This scale was found to be consistent in this study with Cronbach’s alpha equal to 0.83 in the pretest and to 0.81 in the posttest.

The Chinese version of the GHQ-12 (Chan, 1985) was used in this study to assess the general and psychological well-being of students. This scale was found to be consistent in this study with Cronbach’s alpha equal to 0.82 in the pretest and to 0.79 in the posttest.

The Chinese version of the SES (Shek, 1992) was used in this study to assess the self-esteem of the students. This scale was found to be consistent in this study with Cronbach’s alpha equal to 0.85 in the pretest and to 0.81 in the posttest.

For SOC - the higher the score, the higher the sense of coherence; GHQ – the lower the score, the better the psychological well-being; SES – the higher the score, the higher the self-esteem.

Student knowledge on Buddhist teachings was determined by their Form five’s final mock exam scores on RSB.

The effectiveness of the OLP as an intervention was evaluated by measuring the magnitude of change of the experimental group’s SOC as compared with those of two non-intervention control groups. Magnitude of change was calculated by subtracting the pretest score from the posttest score.

Statistical analysis

The pretest-posttest control group design of quasi-experimental design was used in this study. The categorical variables were expressed as frequency (percentage) and compared by Chi-squared test. The continuous variables were expressed as mean +/- standard deviation (SD) and compared by ANOVA. The scatter plots of SOC and each of the other two measurements in the pretest score, posttest score and the magnitude of changes were constructed separately.

Data were analyzed as follows:

(1) The correlations between students' SOC scores and the other two measurements (GHQ, SES) were analyzed to see if there is a correlation between students' ability to handle stress as measured by their SOC score and their overall psychological well-being as measured by the other two measurements. Pearson's correlation coefficient among the three measurements in the pretest scores, posttest scores and scores of the magnitude of changes were calculated.

(2) Comparison of the magnitude of change of the SOC scores of the experimental group (studied RSB and took part in the OLP), control group I (studied RSB but did not take part in the OLP) and control group II (did not study RSB nor took part in the OLP) was carried out by using one-way ANOVA to see whether there is any significant difference among them in order to identify possible enhancement in the students' ability to handle stress by participating in the OLP.

(3) To investigate whether the OLP is a moderator variable as to how significant a student's level of Buddhist knowledge (as measured by exam score) is correlated to his/her ability to benefit from participating in the OLP, (as measured by the magnitude of change in SOC score), statistical tests were run to compare the two following correlations.

- The correlation between the experimental group students' magnitude of change in SOC score and their RSB exam score.
- The correlation between the control group I students' magnitude of change in SOC and their RSB exam score.

(4) To explore whether the OLP is a moderator variable as to how significant a student's level of Buddhist knowledge (as measured by exam score) is correlated to his/her ability to handle stress (as measured by SOC score), a comparison of the following two pairs of correlations would be made:

- The correlation between the experimental group students' pre SOC score

(before they took part in the OLP) and RSB exam score.

- The correlation between the experimental group post SOC score (after they had participated in the OLP) and their RSB exam score.
 - The correlation between the control group I students' pre SOC score and their RSB exam score.
 - The correlation between the control group I students' post SOC score and their RSB exam score.

(5) To explore if Buddhist knowledge (as measured by their exam score) is a moderator variable to a student's capability to benefit from participating in the OLP (as demonstrated by the magnitude of change in their SOC score), one-way ANOVA was run on the SOC magnitude of change on the three following groups of students:

- Comparing experimental group students with passing grade (50 and above) in RSB with control group I and control group II.
- Comparing experimental group students with failing grade (below 50) in RSB with control group I and control group II.
- Comparing experimental group students with passing grade (50 and above) in RSB, control group I students with passing grade (50 and above) in RSB and control group II.

All data analysis was conducted by SPSS (version 14.0) software. Significant level was set as $p < 0.05$.

Results:

The proportion of male and female students in each group was quite balanced. As shown in Table 2, control group I had a slightly higher proportion of female students (57.7%) than the other two groups (51.4% in the experimental group and 50.0% in control group II). There was no significant difference among the groups ($\chi^2=0.341$, $df=2$, $p>0.05$, in Chi-squared test). The mean ages of the three groups were no significant difference among the groups (F-test =1.972, $p>0.05$, in ANOVA).

Most of the respondents had no religion. As expected, there were more students in the experimental group and control group I (13.2% and 13.4% respectively) who were Buddhists than in control group II (6.9%). In comparison, there was more other religion including Christians in control group II (about 22%) than in the other two groups (9% and 13%). There was a significant difference in religion among the groups ($\chi^2=14.662$, $df=6$, $p<0.05$ in Chi-squared test).

Table 2

Characteristics of respondents by groups

	Experimental Group <i>n</i> = 144	Control group I <i>n</i> = 149	Control group II <i>n</i> = 188	Total <i>n</i> = 481
Sex ^a (Female)	74 (51.4%)	86 (57.7%)	93 (49.5%)	253 (52.6%)
Age ^b	15.31 ± 0.85	15.30 ± 0.95	15.5 ± 1.03	15.4 ± 0.96
Religion ^c				
Buddhism	19 (13.2%)	20 (13.4%)	13 (6.9%)	52 (10.8%)
Other religions	13 (9%)	19 (12.8%)	41 (21.8%)	73 (15.2%)
No religion	112 (77.8%)	110 (73.8%)	134 (71.3%)	356 (74%)

a. $p > 0.05$, b. $p > 0.05$, c. $p < 0.05$ **Table 3**

Mean scores (and standard deviations) of three measurements for three groups students

Variables	Pre-test			Post-test			Magnitude of change		
	Experimental N=144	Control I N=149	Control II N=188	Experimental N=144	Control I N=149	Control II N=188	Experimental N=144	Control I N=149	Control II N=188
SOC	55.3 ± 10.6	56.5 ± 11.0	57.7 ± 11.2	56.2 ± 10.7	55.1 ± 9.3	56.5 ± 10.5	0.86 ± 10.1	-1.4 ± 9.0	-1.19 ± 8.5
GHQ	13.1 ± 5.3	12.8 ± 5.2	12.4 ± 5.1	12.4 ± 4.9	13.2 ± 4.5	12.3 ± 4.5	-0.65 ± 4.8	0.36 ± 4.3	-0.12 ± 4.6
SES	18.0 ± 4.5	18.2 ± 4.2	18.7 ± 4.3	18.7 ± 4.1	18.5 ± 3.9	19.1 ± 3.5	0.67 ± 3.2	0.33 ± 3.8	0.39 ± 4.2

(1) A student's SOC and his/her overall psychological well-being as measured by GHQ and SES are significantly related

Scores among the three measurements were found to be highly correlated. This is an indication that a student's SOC and his/her overall psychological well-being as measured by GHQ and SES are significantly related. SOC score was found to be positively correlated to SES, and negatively correlated to GHQ in all the three situations: pretest scores, posttest scores and scores of the magnitude of change. (For SOC - the higher the score, the higher the sense of coherence; GHQ - the

lower the score, the better the psychological well-being; SES – the higher the score, the higher the self-esteem.) For pretest scores, the Pearson’s correlation coefficient (r) between SOC and GHQ was -0.68 (p<0.001); and between SOC and SES is r = 0.60 (p<0.001) (Table 3.1). For posttest scores, the Pearson’s correlation coefficient (r) between SOC and GHQ is -0.67 (p<0.001); between SOC and SES is r = 0.57 (p<0.001) (Table 3.2). For the scores of the magnitude of change, the Pearson’s correlation coefficient between SOC and GHQ is r = -0.54 (p<0.001); and between SOC and SES is r = 0.39 (p<0.001).

Table 3.1

Correlations between the pretest scores of the three measurements for all the students

Variable	1	2	3
1. Sense of Coherence	-		
2. General Health	-0.684**	-	
3. Self-Esteem	0.595**	-0.726**	-

** Correlation is significant at the 0.01 level

Table 3.2

Correlations between the posttest scores of the three measurements for all the students

Variable	1	2	3
1. Sense of Coherence	-		
2. General Health	-0.674**	-	
3. Self-Esteem	0.574**	-0.751**	-

** Correlation is significant at the 0.01 level.

Table 3.3

Correlations between the magnitudes of changes of the three measurements of all the students

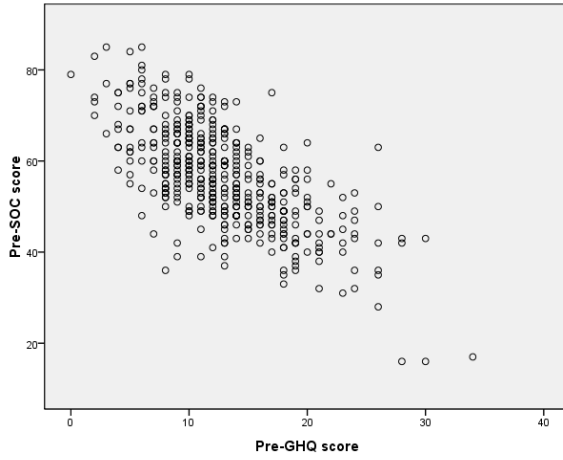
Variable (Delta)	1	2	3
1. Sense of Coherence	-		
2. General Health	-0.544**	-	
3. Self-Esteem	0.393**	-0.582**	-

** Correlation is significant at the 0.01 level

Scatter plots of SOC score and the scores of the other two measurements in pre-test and post-test were also presented in the following to further demonstrate the correlation among the measurements in Figures 2, 3, 4 & 5.

Figure 2

Scatter plot of pre-SOC score and pre-GHQ score:

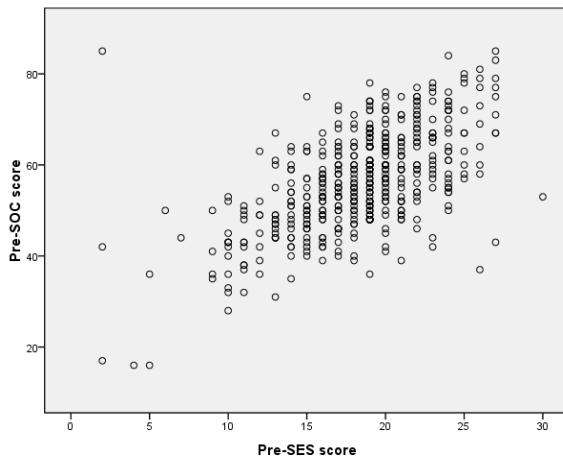


R=0.684, R-square=0.468, (p<0.001 for linear regression)

Linear equation: Pre-SOC score = 75.009 – 1.447 × pre-GHQ score

Figure 3

Scatter plot of pre-SOC score and pre-SES score:

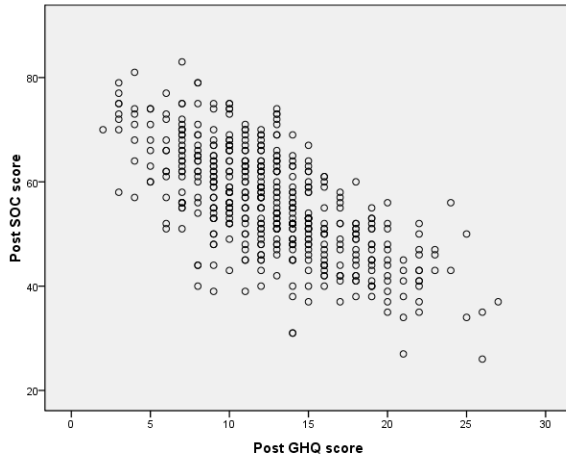


R=0.595, R-square=0.354, (p<0.001 for linear regression)

Linear equation: Pre-SOC score = 28.97 + 1.507 × pre-SES score

Figure 4

Scatter plot of post-SOC score and post-GHQ score:

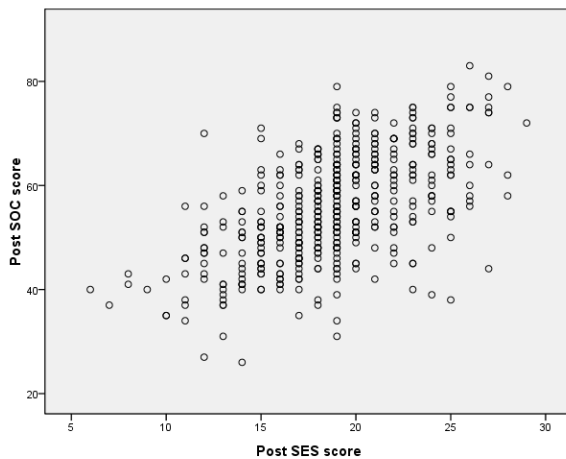


R = 0.674, R-square = 0.454, (p < 0.001 for linear regression)

Linear equation: Post-SOC score = 74.698 - 1.488 × post-GHQ score

Figure 5

Scatter plot of post-SOC score and post-SES score:



R = 0.574, R-square = 0.330, (p < 0.001 for linear regression)

Linear equation: Post-SOC score = 27.052 + 1.538 × post-SES score

(2) Comparison among experimental group, control group I and control group II: the change in pretest and posttest SOC, GHQ and SES scores using one-way ANOVA

No significant difference was noted in the means of the three measures of the three groups of students (see table 4).

Table 4

Comparison of mean scores of SOC, GHQ and SES using one-way ANOVA

Mean difference	Experimental group	Control group I mean	Control group II mean	F	Sig.
SOC	0.86	-1.4	-1.19	2.81	0.061
GHQ	-0.65	0.36	-0.12	1.83	0.161
SES	0.67	0.33	0.39	0.34	0.731

(3) To investigate whether the OLP is a moderator variable as to how significant a student's level of Buddhist knowledge (as measured by exam score) is correlated to his/her ability to benefit from participating in the OLP, (as measured by the magnitude of change in SOC score), statistical tests were run to compare the two following correlations

- ***The correlation between the experimental group students' magnitude of change in SOC score and their RSB exam score.***

The magnitude of change in SOC score and the RSB exam score in the experimental group students was found to be statistically significant and it was positively correlated ($r = 0.183$, $N=144$, $p < 0.05$, two tails) (Figure 6)

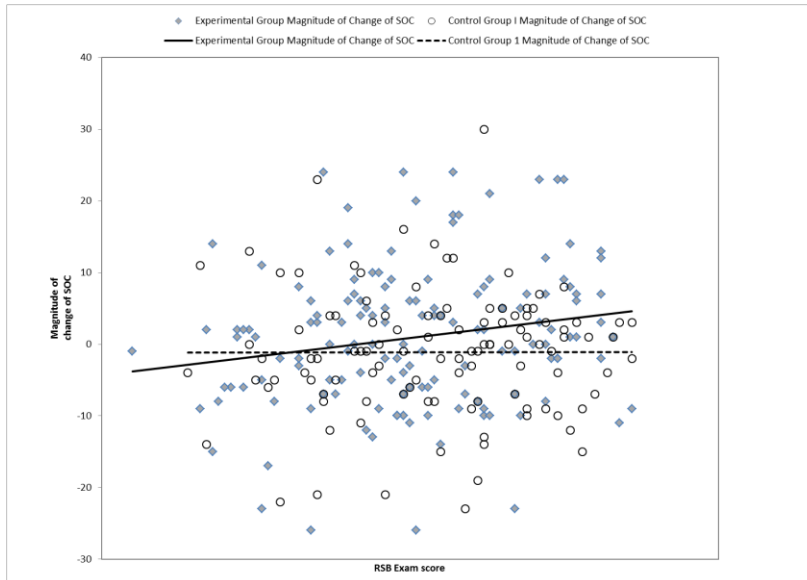
- ***The correlation between the control group I students' magnitude of change in SOC and their RSB exam score.***

The magnitude of change in SOC score did not correlate significantly with the RSB exam score in the control group I students², $r = 0.003$, $N=111$, ns, two tails. (Figure 6)

² There were only 111 students in comparison group I that took the RSB final exam because one school had only one class that took the subject as requirement and that class became the experimental class. The comparison class I in this school took the RSB as an elective that did not need to sit for exam.

Figure 6

Correlation between magnitude of change of SOC and RSB exam score of experimental group (N=144) and control group I (N=111)



(4) To explore if the OLP is a moderator variable as to how significant a student's level of Buddhist knowledge (as measured by exam score) is correlated to his/her ability to handle stress (as measured by SOC score), comparison of the following two pairs correlations were made:

- ***The correlation between the experimental group students' pre SOC score (before they took part in the OLP) and RSB exam score.***

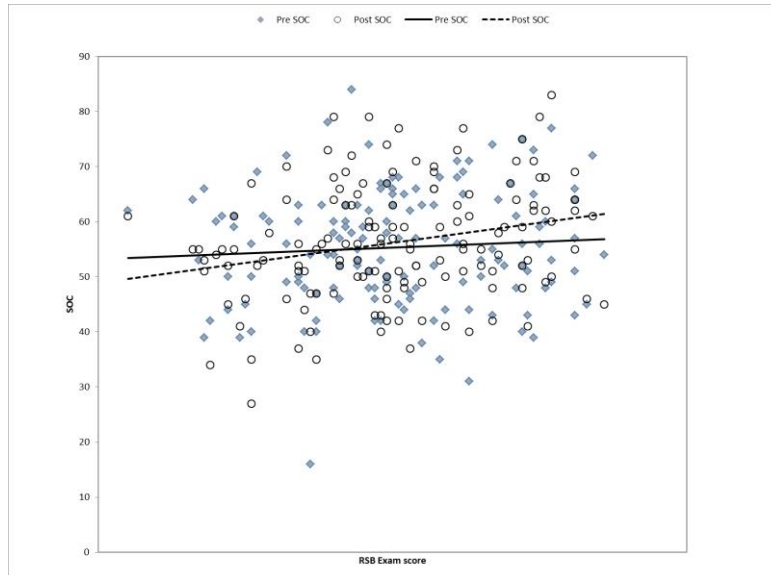
There was no significant correlation between the experimental group students' pre SOC score and RSB exam score, $r = 0.073$, ns, two tails. (Figure 7)

- ***The correlation between the experimental group post SOC score (after they had participated in the OLP) and their RSB exam score.***

Significant correlation was noted between the experimental group students' post SOC score and RSB exam score, $r=0.245$, $p < 0.05$, two tails. (Figure 7)

Figure 7

Correlation between pre SOC and RSB exam score & post SOC score and RSB exam score of the experimental group

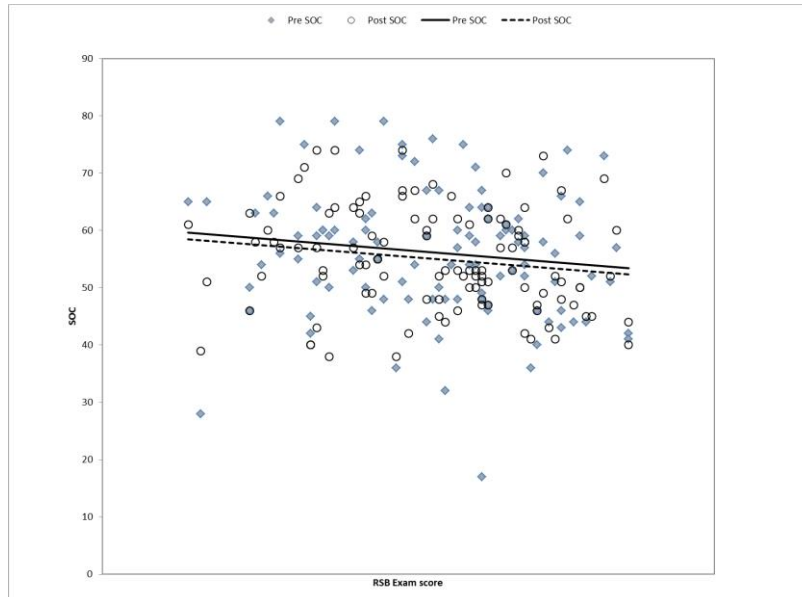


- *The correlation between the control group I students' pre SOC score and their RSB exam score.*
- *The correlation between the control group I students' post SOC score and their RSB exam score.*

For control group I students, no statistical significant correlation was noted between their pre SOC score and RSB exam score,($r=-0.135$, ns, two tails) and post SOC score and RSB exam score ($r = -0.165$, ns, two tails). (Figure 8)

Figure 8

Correlation between pre SOC and RSB exam score & post SOC score and RSB exam score of the control group I



(5) To explore if Buddhist knowledge (as measured by their exam score) is a moderator variable to a student's capability to benefit from participating in the OLP (as demonstrated by the magnitude of change in their SOC score), one-way ANOVA was run on the SOC magnitude of change on the three following groups of students

- *Comparing experimental group students with passing grade (50 and above) in RSB with control group I and control group II.*

There was a significant effect of the RSB exam score influences on the magnitude of change SOC at the $p < 0.05$ level for the three groups [$F(2,406) = 4.075, p < 0.05$]. Post hoc comparisons using the Fisher LSD test indicated that the mean score of the magnitude of change in SOC for the experimental group students with passing grade (50 and above) in RSB ($M = 2.06, SD = 10.59$) was significantly different than the control group I ($M = -1.41, SD = 8.95$) and the control group II ($M = -1.19, SD = 8.45$). (Table 5.1 & Table 5.2)

Table 5.1

Mean scores (and standard deviations) of the magnitude of change in SOC scores of the students in experimental group with RSB score higher than 50, in control group I and in control group II

Variables	Experimental N=72	Control I N=149	Control II N=188
SOC	2.06 ± 10.59	-1.41 ± 8.95	-1.19 ± 8.45

Table 5.2

Post hoc comparisons (LSD test) for data Table 5.1

Group (I)	Group (J)	Mean Difference (I-J)	Std. Error	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
Experimenta l (RSB score with passing mark ≥ 50)	Control I	3.46*	1.30	0.008	0.91	6.02
	Control II	3.24*	1.25	0.010	0.79	5.70
Control I	Control II	-0.22	0.99	0.822	-2.17	1.73

*. The mean difference is significant at the 0.05 level

- ***Comparing experimental group students with failing grade (below 50) in RSB with control group I and control group II.***

There were no statistically significant differences between group means as determined by one-way ANOVA ($F(2,406) = 0.371$, ns, two tails) (Table 5.3)

Table 5.3

Mean scores (and standard deviations) of the magnitude of change in SOC scores of the students in experimental group with RSB score below 50, in control group I and in control group II

Variables	Experimental N=72	Control I N=149	Control II N=188
SOC	-0.33 ± 9.55	-1.41 ± 8.95	-1.19 ± 8.45

- *Comparing experimental group students with passing grade (50 and above) in RSB, control group I students with passing grade (50 and above) in RSB and control group II.*

There was a significant effect of RSB exam scores on magnitude of change SOC at the $p < 0.05$ level for the three groups [$F(2, 325) = 3.624, p < 0.05$]. Post hoc comparisons using the Fisher LSD test indicated that the mean score of the magnitude of change in SOC for the experimental group students with passing grade (50 and above) in RSB ($M = 2.06, SD = 10.59$) was significantly different than the control group I students with passing grade (50 and above) in RSB ($M = -1.06, SD = 8.33$) and the control group II ($M = -1.19, SD = 8.45$). However, no significant difference was noted between those control group I students with passing grade when compared with those in control group II ($M = -1.19, SD = 8.45$). (Table 5.4 & Table 5.5)

Table 5.4

Mean scores (and standard deviations) of the magnitude of change in SOC scores of the students in experimental group with RSB score higher than 50, in control group I with RSB score higher than 50 and in control group II

Variables	Experimental N=72	Control I N=68	Control II N=188
SOC	2.06 ± 10.59	-1.06 ± 8.33	-1.19 ± 8.45

Table 5.5

Post hoc comparisons (LSD test) for data Table 5.4

Group (I)	Group (J)	Mean Difference (I-J)	Std. Error	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
Experimental	Control I	3.11*	1.51	0.04	0.14	6.08
	Control II	3.24*	1.23	0.01	0.80	5.68
Control I	Control II	0.13	1.26	0.92	-2.36	2.62

* The mean difference is significant at the 0.05 level

Discussion

In the following, we will discuss our results and findings:

- (1) There were significant correlation between students' ability to handle stress, as measure by SOC, and their overall psychological well-being, as measured by GHQ and SES.

This finding confirmed with prior findings of numerous other studies (Gibson and Cook 1996; Bengel, Strittmatter et al. 1999; Suominen, Helenius et al. 2001; Atroshi, Andersson et al. 2002; Savolainen, Suominen-Taipale et al. 2005). The fact that these correlations were highly significant in both the pretest and posttest analyses indicated that the relationships were stable over time and were not affected by events that occurred during the intervention period. This finding contrasted with Snekkevik's findings that, although SOC scores of subjects were not stable over time after multiple trauma, but when SOC and Satisfaction with Life Scale were "measured simultaneously, overall life satisfaction and occurrence of anxiety were significantly associated with SOC". (Snekkevik, Anke et al., 2003)

More important to this study is the finding that the correlations of the three measurements also existed in the pre-post magnitude of change. This is an endorsement of one of the assumptions of this project ---if we can enhance the SOC of students, not only would the student's ability to handle stress be enhanced, but their general psychological well-being as measured by GHQ and SES should also be enhanced.

(2) As to the primary outcome measure of this project, no significant difference in the magnitude of change in SOC score among the three groups of students was noted. This indicates that the OLP was not able to significantly improve the experimental group students' ability to handle stress when compared with those students in control group I and II. Why was there no significant effect? We believe the following two reasons were the major weakness of the OLP:

(a) Lack of initiative and motivation

In order for such a school-based life education program to be successful, the participants' initiative and motivation are very important. Unfortunately, the OLP team members had a hard time drumming up the initiative and motivation of the students because of the following logistic difficulties: because of tight school schedule, the 20 workshops of the OLP took place after school as an extracurricular activity for the students; the students were assigned by the school administrator to take part in the program instead of volunteered. Furthermore, the students were just young teenagers; the benefit of participating in a stress reduction program after school may not have been very obvious to them. Because of the above situations, the initiative and motivation of the participating students were not high.

(b) Lack of synergy and cohesion

The 20 workshops and the three special activities were spread out over 15 months. During the period, the OLP team members only met with the students about once a month and we were not able to assign homework because the program was just extracurricular activity for the students. As a result, many of the students forgot what they had learned during the last meeting; therefore the series of workshops were not able to develop synergy and cohesion to make an impact in the mind of the students.

(3) The OLP appeared to be a moderator variable as to how significant is a student's level of Buddhist knowledge (as measured by exam score) correlated to his/her ability to benefit from participating in the OLP, (as measured by the magnitude of change in SOC score) because:

A significant correlation between the experimental group students' (took part in the OLP) magnitude of change in SOC score and their RSB exam score was noted. While no correlation was noted between the control group I students' (did not take part in the OLP) magnitude of change in SOC and their RSB exam score.

This implies that by participating in the OLP, the experimental group students' level of Buddhist knowledge developed a correlation with their magnitude of change in their SOC. However, this correlation did not exist for those students (control group I) who did not take part in the OLP.

- (4) The OLP appeared to be a moderator variable as to how significant is a student's level of Buddhist knowledge (as measured by exam score) correlated to his/her ability to handle stress (as measured by SOC score), because:

A significant correlation between the experimental group students' post SOC score (after they had participated in the OLP) and their RSB exam score was noted. While no correlation was noted between the experimental group students' pre SOC score (before they took part in the OLP) and their RSB exam score.

As for those students in control group I (did not take part in the OLP at all), no correlation was noted between both their pre SOC score and post SOC score and their RSB exam score.

This implies that by participating in the OLP, the experimental group students' level of Buddhist knowledge (as measure by their exam score) has developed a correlation with their ability to handle stress (as measure by their SOC score).

A summary of the above two observations (point 3 and 4) is that: when a student had participated in the OLP, his or her RSB exam score would become correlated with both his/her magnitude of change in SOC score and his/her post SOC score. On the other hand, when a student had not taken part in the OLP, these two correlations did not exist.

- (5) When the mean of the magnitude of change in SOC score for those students in the experimental group who passed their RSB exam was compared with those students in control group I and control group II, significant different was noted. However, no significant different was noted in the mean of the magnitude of change in SOC scores among those students who failed their RSB exam when compared with those students in control group I and control group II. This implies that students' level of Buddhist knowledge, as indicated by their pass/fail in their RSB exam, moderated their ability to benefit from participating in the OLP, as reflected by their magnitude of change in SOC score. At the same time, no significant difference was noted between those scores of control group I students with passing grade when

compared with those in control group II.

From the above analysis, we are able to observe:

1. Only those students that have participated in the OLP and, at the same time, have passed their RSB exam were able to enhance their ability to handle stress in a significant way when compared with the two control groups.

This indicates that having a good knowledge of Buddhist Teachings alone is not enough as those students in control group I that have passed their RSB exam were not able to demonstrate a significant difference in the magnitude of change in SOC score when compared with control group I and II.

These findings are, however, in contrast with the finding of Kristensson and Ohlund's study (Kristensson, 2005). Kristensson and Ohlund found that SOC and school performance (as measured by school marks) are interrelated. Those who are able to acquire knowledge through core course at school are related to a person's ability to successfully deal with stressors as indicated by SOC score. In the current program, this correlation only exists in those students that have a good knowledge on Buddhist teachings and have participated in the OLP and was not universal to all students. There could be many reasons as to why there is such an inconsistency between the two findings, for example, the difference in the cultural and social background of the students in the two researches.

2. Those students in the experimental group that have failed their RSB exam did not demonstrate a significant different in their magnitude of change in SOC score when compared with control group I and II.

This indicates that without a good foundation of Buddhist Teachings even if the students did participate in the OLP, he or she is not going to benefit significantly from the program.

The above findings implied that the OLP was a valid moderator variable because the level of Buddhist knowledge of those students that went through the program did develop a significant (although weak) correlation with how their ability to handle stress has changed by participating in the OLP (the magnitude of change in their SOC score). This correlation did not exist in those students that did not go through the OLP (control group I students). Therefore, the OLP was only successful in enhancing the ability to handle stress of those students that did well in their RSB

exam but failed to help those students that failed their RSB exam.

In other words, a student's SOC can be enhanced by participating in the OLP if the student has a good understanding of Buddhist knowledge -- both Buddhist knowledge and practices (in the form of the OLP) were needed. Thus, without the theoretic foundation of the Buddhist teachings, it would be difficult for a student to gain significant benefit from participating in the OLP intervention.

These findings do actually echoed and could be explained by the Buddhist Teaching on the three kinds of knowing that we have mentioned briefly in the above, namely,

1. Wisdom consisting of learning
2. Wisdom produced by thinking
3. Wisdom realized by practice

The following is the Buddha's explanation of the three kinds of knowing in the important Mahayana text *Sandhinirmochana Sutra* (解深密經) :

1. "Wisdom consisting of learning is based on words and only conforms to explanation; one still has not skillfully directed the mind or actualized the Teaching. One follows liberation but cannot yet take in the meaning of attainment of liberation.
2. Wisdom produced by thinking is also based on words, but it is not merely literal; one also skillfully directs the mind. But one does not yet actualize the Teaching. One follows liberation even more but still cannot yet take in the meaning of attainment of liberation.
3. As for enlightening beings' wisdom realized by practice, it is both based on words and not based on words, both according to the explanation and not according to the explanation; they skillful direct their minds to what is to be known, and the corresponding images on which concentration is focused actually appear. They ultimately conform to liberation and are able to take in the meaning of attainment of liberation. This is called the distinction of the three kinds of knowing."(Cleary, 1995)³

³ 《解深密經》卷三：「佛告慈氏菩薩曰：善男子，聞所成慧依止於文，但如其說，未善意趣，未現在前，隨順解脫，未能領受成解脫義。思所成慧亦依於文，不唯如說，能善意趣，未現在前，轉順解脫，未能領受成解脫義。若諸菩薩修所成慧，亦依於文，亦不依文，亦如其說，亦不如說，能善意趣，所知事同分三摩地所行影像現前，極順解脫，已能領受成解脫義。」

If we match the three kinds of knowing to the scenarios that we have delineated from our findings, they would be as follow:

1. Wisdom consisting of learning: would be matched with those students that have studied the RSB but failed in their exam, that is, they have learned the words and teachings but “still has not skillfully directed the mind or actualized the Teaching”.
2. Wisdom produced by thinking: would be matched with those who have studied the RSB and passed the exam, that is, they have contemplated on the words and teachings and not merely literal. Therefore, they could pass their examination. But he or she still has not yet actualized the Teaching and “cannot yet take in the meaning of attainment of liberation”. Hence, the magnitude of change in SOC for those students in control group I that have passed their RSB exam still did not demonstrate significant different in their magnitude of change mean score when compare with those in control group II because they lack the experimental learning experience from the OLP.
3. Wisdom realized by practice: would be matched with those students who have participated in the OLP and, at the same time, passed their RSB examination. That is, they have learned their knowledge by contemplating on the words and teachings (as demonstrated by passing their examination) and, at the same time, participated in the OLP practices of meditation and other contemplative activities.

Limitation

One of the limitations of this project is that students were not randomly allocated into the three groups. Because of administrative difficulty, we were not able to randomly assign student in to the three different groups. The selection of which classes to participate in this project was decided by the schools administrators.

Conclusion

In the stressful environment of today’s school life, a student’s ability to handle stress is important to his/her overall psychological well-being, and possibly his/her academic performance. Our findings support this statement as we did observe that students’ ability to handle stress as measured by their SOC score is correlated to their psychological well-being as measured by their GHQ and SES scores. Furthermore, correlation between SOC score and RSB exam score was also noted in those students that have passed their RSB exam and participated the OLP.

The OLP was only able to enhance a sub-group students' (those who passed their RSB exam and participated in the OLP) ability to handle stress significantly, while failing to do so with the whole experimental group. The shortfall of the program could come from not being able to become a part of the normal school curriculum with regular class time and authority to assign regular homework. Any future school-based program should take into consideration the difficulties that we faced.

Furthermore, from the findings in our data, it supported that all three kinds of knowing of Buddhist Teachings are important and they seemed to be correlated and interdependent. Future programs that aim at enhancing students' ability to handle stress and psychological well-being should consider incorporating both theoretic teachings and experiential workshops in their design.

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