Hopelessness and Suicidal Behavior among Chinese, Thai and Korean College Students and Predictive Effects of the World Health Organization's WHOQOL-BREF

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Abstract

The purpose of this study was to assess the current status of suicide behavior and to examine the association between hopeless feelings, suicidal behavior and components of the WHO Quality-of-Life-BREF instrument among college students (n=1,217) in China, Thailand, and Korea. Results showed 3.7% Thai, 10% Chinese, and 13.2% Korean students exhibited suicidal behavior in the past 12 months. Most components of the Quality-of-Life-BREF were significantly associated with hopeless feelings among Chinese, Thai, and Korean students. Also, all components were significantly associated with suicidal behavior among Chinese, Thai, and Korean students except the psychological domain among Thai students. In conclusion, these findings may help university administrators better understand the current status of suicide behavior and reduce potential suicide attempts among college students in certain Asian countries.

Keywords: *College students • Suicide • Hopelessness • WHOQOL-BREF*

Introduction

In Western countries, e.g. U.S., suicide is a significant and complex public health issue and has been widely studied among college students[1,2] as well as in other populations.[3,4] The suicide rate among American young people aged 15 to 24 years had nearly tripled in 40 years before the year 1998, whereas the suicide rate of the overall population had remained stable.[5] In 2005, suicide was identified as the third leading cause of death among 12 and 24year-olds.[6] A number of studies have examined the rates of suicide among American college students. For example, Wright, Snodgrass, and Emmons[7] found that 5.7% of males and 6.1% of females among 1,768 college participants had seriously thought of a suicide attempt within the last six months. Westefeld and Furr[8] found that out of 962 college students, 81% had experienced depression since beginning college, 32% had thought about committing suicide, and 4% had attempted suicide during their lives.

Based on the National College Health Risk Behavior Survey, Barrios et al.[2] found that during the 12 months prior to the survey, 11% of U.S. students seriously considered suicide, 8% made a suicide plan, and 2% attempted suicide. Although the findings of previous studies on the issue of suicide rates among American college students were not very consistent or accurate due to some difficulties (e.g. no effective record system for suicide incidents, underreporting, or mislabeling suicides to avoid negative publicity), Westefeld et al.[1] claimed that great effort should be made to reduce those rates no matter how low they might be because suicide on college campuses is a "tragedy."

To prevent suicidal behavior, a number of researchers have tried to find out the reasons why college students had attempted suicide. While summarizing the findings of previous studies which have examined univariate relations between specific risk factors and suicide, Lewinsohn et al.[9] proposed a comprehensive and integrated model including clustered four constructs: psychopathology, physical illness, environment, and interpersonal problems. The structural equation modeling (SEM) analysis showed that psychopathology indicated by variables of depression, anxiety, disruptive behavior, etc is the single most influential effect on suicidal behavior. Physical health and environment significantly contributed to suicidal behavior although the effect was relatively small when compared to psychopathology. Interpersonal problems did not have direct effect without the mediation of cognition and coping. However, this study has its limitations. Although the major findings based on this modeling[9] have been affirmed, some studies suggested more variables needed to be examined relative to suicidal behavior among adolescents. For example, hopelessness was found to be more predictive of future suicide attempts than depression[10] and hopelessness was identified to be one of the two most critical factors (i.e. hopelessness and loneliness) playing a role in suicide attempts.[8,11] Furthermore, the model proposed by Lewinsohn et al.[9] was based on adolescents, so the relationship between the constructs and suicidal behavior among college students remained unclear.

With the influence of studies on the suicide issue in Western countries, more and more researchers have paid attention to the suicide issue in Asian countries.[12-14] However, scarce data was found for examination of the suicide related behaviors among college students, although studies focusing on other populations[14-18] were commonly available. Despite the lack of data regarding the suicide rates in Asian countries, the findings of the studies relating to hopelessness in Asian college students indicated that the suicide behavior might be a significant issue among Asian college students as well as among their Western counterparts.

In three school-based Asian samples, i.e. Taiwanese, Philippine and Thai adolescents, it was found that those who attempted suicide had higher scores in hopelessness and loneliness than non-attempters.[18] Among Korean young people, hopeless feelings were an important component of depression, which was the strongest predictor of suicide behaviors.[15] Since hopelessness is the best predictor of suicidal ideation and suicide attempts,[19] it is reasonable to deduce that attempting suicide may be a significant issue among Asian college students. Range and Penton[20] suggested that treating college students' hopefulness discouraged the development of suicidal thoughts or actions. It was demonstrated that the hopelessness felt by college students led to suicidal ideations and was affected by negative life events.[21] This implied that properly assessing the influences of negative life events may help the campus administrators to diagnose in a timely fashion the magnitude of hopelessness and suicidal ideation and thus, further prevent suicidal behavior among at-risk college students.

The World Health Organization's (WHO) Quality of Life (WHOQOL) instrument was developed to assess the quality of life of people in different cultural

environments. The brief version of WHOQOL, namely the WHOQOL-BREF, has been validated internationally[22] and widely used among various populations, such as older adults,[23] adult patients,[24] and college students[25] in a variety of cultures over the last two decades. The broad and comprehensive feature of WHOQOL could involve multiple dimensions, in each of which negative life events may happen. So the WHOQOL-BREF was considered an instrument to assess the college students' negative attitudes towards their lives which may cumulatively lead to negative life events, hopeless feelings, suicidal ideation and suicidal behavior.

In order to examine the current status of the suicide issue among Asian college, the participants in this study consisted of college students from three Asian countries, two from East Asia (China and Korea) and one from South East Asia, (Thailand).

Purpose of Study

The major purpose of this study was to examine the association between the components of WHOQOL-BREF and the sustained sad or hopeless feelings and suicidal behavior among the three sampled college student groups. The following hypotheses were drawn from this study: (1) sustained sad or hopeless feelings were significantly associated with suicidal behavior, (2) two generic items of WHOQOL-BREF, general health and quality of life, were significantly associated with sustained sad or hopeless feelings and suicidal behavior, and (3) the four domains of WHOQOL-BREF were significantly associated with sustained sad or hopeless feelings and suicidal behavior among Chinese, Thai, and Korean College students.

Methods

Participants and procedures

The questionnaires were administered in classes during the period between 2006 and 2007. A passive consent letter was attached to the top of the questionnaire to ensure voluntary and anonymous participation. Among a total of 1,400 students who were invited, 1,217 (86.9%) participated in the survey. About 26% of the respondents were students from one university in China, 33% from one university in Thailand, and 41% from one university in Korea. Among Chinese students (n = 311, mean age = 20.3, SD = 1.1), 44% were males, 51% freshmen, and 49% sophomores. Among Thai students (n = 407, M = 20.5, SD = 1.2), 44% were males, 29% freshmen, 43% sophomores, 18% juniors and 10% seniors or graduate students. Among Korean students (n = 499, M = 21.9, SD = 4.8), 37% were males, 13% freshmen, 30% sophomores, 30% juniors and 27% seniors or graduate students. The survey was administered in classroom during the last 25 minutes of each class. The trained survey administrators informed the students that their participation was voluntary, and that data would remain confidential and be reported only by group. The students were permitted to leave if they were not interested in this study, otherwise the students stayed until they completed the questionnaires. The study protocol was first approved by the Institutional Review Board (IRB) at the principal research site – Indiana University, and then was submitted by colleagues for approvals at their institutions. The survey was carried out after the approval from all participating sites.

Instruments

The brief version of the WHO Quality of Life Assessment instrument (WHOQOL-BREF) in Chinese, Thai, and Korean languages was used to collect data pertaining to the quality of life. The WHOQOL-BREF consisted of 26 standard items including two generic items, overall quality of life and general health, and 24 other items, which were classified into four domains, i.e. physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental health (8 items). Each of the 24 items of the four domains were derived from each of the 24 facets in the WHOQOL-100 to ensure a broad and comprehensive instrument.[26]

Four questions were derived from the 2005 Youth Risk Behavior Survey (YRBS).[27] They were, "During the past 12 months, (1) did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities? (2) did you ever seriously consider attempting suicide? (3) did you make a plan about how you would attempt suicide? and (4) how many times did you actually attempt suicide?" Those four questions were used to generate the two outcome variables, sustained sad or hopeless feelings and suicidal behavior.

Variables

Outcome variables

One of the outcome variables " sustained sad or hopeless feelings" was generated from the first YRBS question, with 1 being a feeling of sad or hopeless almost every day for two weeks or more in a row in the past 12 months and 0 = no such feeling. Another outcome variable was "suicidal behavior" which was a composite of other 3 YRBS questions. The suicidal behavior was coded as 1 (had at least one suicidal behavior in the past 12 months), if the participants answered "yes" to the second YRBS question, and/or answered "yes" to the third YRBS question, and/or indicated at least once to the third YRBS question presented in the questionnaire. Otherwise, suicidal behavior was coded 0 (no suicidal behavior in the past 12 months).

Gender, age group, and class standing

Gender, age group, and class standing were three demographic and categorical variables. For gender, male was coded as 1 and female was coded as 0. Students were categorized in five age groups, i.e. 1 = less than 19 years, 2 = 19 –21 (not including 21) years, 3 = 21 – 23 (not including 23) years, 4 = 23 – 25 (not including 25) years, and 5 = 25 years or older. Students were coded using four class standings, i.e., 1 = freshmen, 2 = sophomores, 3 = juniors, and 4 = seniors or graduate students.

Overall quality of life and general health

Overall quality of life and general health were two generic items asking about individual overall perceptions of quality of life and individual general health status, respectively. The response options of these two items were scored in a positive direction on a 5-point scale. (See details in Data analysis).

Physical health, psychological health, social relationships, and environment

Physical health, psychological health, social relationships, and environment were four combined variables representing four domains derived from the 24 items. The response options of 21 of the 24 items refer to a favorable direction (i.e., higher scores indicate higher quality of life). Three items originally coded in a negative direction were reversely recoded for this analysis. The domain scores were calculated by averaging the scores of the items within each domain. The mean domain scores were then multiplied by 4 to make them comparable with those used in the WHOQOL-100.[28]

Data analysis

Statistical analyses were carried out using the statistical program SPSS 15.0.[29] Chi-square tests of independence were applied to test the relationships between outcome variables and predictors.

The differences in the overall quality of life, general health, and scores of four domains were tested using independent t-tests between those who had sustained sad or hopeless feelings and suicidal behavior, and those who did not. Effect sizes were calculated to determine meaningful differences in the group mean scores. Using Cohen's *d* with mean differences divided by the pooled standard deviation.[30] Cohen's *ds* of 0.20, 0.50, and 0.80 were considered small, medium, and large effects respectively. [30]

Overall quality of life and general health based on 5 point Likert scales were collapsed into three categories (1 = very poor or poor/very dissatisfied or dissatisfied, 2 = neither poor nor good/neither satisfied nor dissatisfied, and 3 = good or very good/satisfied or very satisfied) to satisfy the assumption of the Chi-square test, i.e., the expected count is no less than 5 in every cell. Binary and multivariate logistic regressions were applied to examine associations between each of the two outcome variables and predictive variables.

The variables with bivariate p-value $\leq .10$ in chi-square tests were entered into the logistic regression models. But the three demographic variables, i.e. gender, age group, and class standing, were included in the models as controlling variables regardless of significance. Adjusted odds ratios (AORs) of each single predictor were reported with a 95% confidence interval (CI) after adjusting for gender, age groups, and class standings. The level of significance was set at p=.05. Sustained sad or hopeless feelings were evaluated as a mediator between overall quality of life and general health, and suicidal behavior using a series of regression analyses outlined by Baron and Kenny.[31] First, the mediator is regressed on the independent variable. Second, the dependent variable is regressed on the independent variable. Third, the dependent variable is regressed on both independent variable and mediator. To determine the occurrence of the mediation, three conditions must be satisfied.[31] First, the independent variable should have impact on the mediator in the first analysis. Second, the independent variable should have impact on the dependent variable in the second analysis. Third, the mediator must have impact on the dependent variable in the third analysis. In this study, the variable of sustained sad or hopeless feelings was the mediator, overall quality of life and general health status are

independent variables, and suicidal behavior was the dependent variable.

Results

As detailed in Table 1, in the past 12 months, approximately 1 to 5% of the Asian college students reported suicide attempts with the lowest rate in Thailand and the highest rate in China. Approximately 4 to 17% of the Asian college students reported suicidal ideation (a composite of seriously considered attempting suicide and a plan made about how to attempt suicide) with the lowest rate in Thailand and the highest rate in Korea. After combining those who seriously considered attempting suicide, made a plan about how to attempt suicide, and actually attempted suicide to suicide behavior, to the outcome variable, suicide behavior, about 4-13% of Asian college students reported having suicide behavior in the past 12 months with the lowest rate (3.7%) in Thailand, medium rate (10%) in China, and the highest rate (13.2%) in Korea.

As shown in Table 2, there were significant differences among Chinese, Thai, and Korean students ($p<.05$, .01, or .001) in overall quality of life, general health, and the four domains between the students who felt sad or hopeless almost every day for two weeks or more in a row and those who did not, except the difference in social relationships domain in Korean students (Table 2). There were significant differences among Chinese and Korean students ($p<.05$, .01, or .001) in overall quality of life, general health, and four domains between the students who had suicidal behavior. Among Thai students, the significant difference ($p<.01$) in terms of suicidal behavior appeared only in the two domains of psychological health and environment. For most of the significant differences, the effect size was medium (Cohen's $d>0.5$) or large (Cohen's $d>0.8$) (Table 2), indicating the differences in overall quality of life, general health, and four domains were meaningful between those who sustained sad or hopeless feelings and had suicidal behavior, and those who not.

Chi-square analyses (Table 1) showed that Korean students were more likely to report sustained sad or hopeless feelings ($\chi^2_{(2)} = 16.4$, $p<.001$) and suicidal behavior ($\chi^2_{(2)} = 24.71$, $p<.001$) than Chinese and Thai students, whereas Chinese students were more likely to report having attempted suicide ($\chi^2_{(2)} = 9.09$, $p=.01$) than Korean and Thai college students.

Significant associations were found between suicidal behavior and sustained sad or hopeless feelings among Chinese ($\chi^2_{(1)} = 62.1$, $p<.001$), Thai ($\chi^2_{(1)} = 29.3$, $p<.001$), and Korean ($\chi^2_{(1)} = 46.0$, $p<.001$) students (Table 3).

Chi-square analysis was also used to examine the associations between two outcome variables and the correlates of interest among Chinese, Thai, and Korean college students respectively. Results of Chi-square analysis (not shown in the paper) were used as a criterion to involve predictors in the logistic regression. Overall quality of life and general health were included in the logistic regression models only if p value was less than .10. Because the gender, age group, and class standing were important characteristics for college students, they were included in the multivariate logistic regression as controlling variables although statistically significant bivariate associations between those three variables and outcome variables did not appear all the time. Except the associations of overall quality of life ($\chi^2_{(2)} = 0.76$, $p=0.69$) and general health ($\chi^2_{(2)} = 0.2$, $p=0.91$) with suicidal behavior, all other bivariate associations between overall quality of life, general health, four domains and the two outcome variables were statistically significant among Thai students. Thus, overall quality of life and general health were not in the logistic regression models among Thai students.

Results of logistic regression including adjusted odds ratios (AOR) and 95% confidence intervals (95% CIs) are presented in Table 4 and 5. All these reported results have been adjusted for gender, age group, and class standing. Among Chinese college students, the predictive effects of all predictors, i.e. overall quality of life, general health, and four domains, on the two outcome variables were statistically significant ($p<.05$, .01 or .001). For example, those who reported poor or very poor in quality of life (AOR = 28.46) were more likely than those who reported good or very good quality of life to have experienced sustained sad or hopeless feelings in the past 12 months. The odds of suicidal behavior were significantly decreased ($p<.001$) by factors of 0.63, 0.73, 0.76, and 0.79 respectively with a one-unit increase in the domains of physical health, psychological health, social relationships, and environment. Among Thai college students, the predictive effects of all predictors, i.e. overall quality of life, general health, and four domains, on the sustained sad or hopeless feelings (Table 5) were

statistically significant (p<.05, .01 or .001), whereas only psychological health had significantly predictive effect (p<.05) on the suicidal behavior (Table 5). Among Korean students (Table 4 and 5), all predictors predicted sustained sad or hopeless feelings and suicidal behavior significantly (p<.05, .01 or .001), however the predictive effect of social relationship on sustained sad or hopeless feelings was not statistically significant (p>.05).

Sustained sad or hopeless feelings were evaluated as mediator in the relationship between suicide behavior and overall quality of life and general health among Chinese and Korean students. The mediation was not evaluated among Thai students because of the nonsignificant associations of overall quality of life and general health with suicidal behavior. All conditions for mediation were met (Table 4, Table 3, and Table 6 in order). In the final logistic regression model (Table 6), after controlling for the mediator (i.e. sustained sad or hopeless feelings), very poor or poor overall quality of life was partially mediated (AOR=12.59 in Table 6< AOR=33.87 in Table 5), but neither poor nor good was fully mediated (AOR=3.46, p>.05) among Chinese college students. Among Korean college students, after controlling for the mediator (i.e. sustained sad or hopeless feelings), very poor or poor overall quality of life was fully mediated (AOR=2.33, p>.05), but neither poor nor good was partially mediated (AOR=3.32 in Table 6< AOR=2.23 in Table 5).

Discussion

Based on the data from three Asian colleges, findings of this preliminary study indicated different overall rates of suicide attempts and suicidal ideation across the three Asian countries, i.e. China, Thailand, and Korea (Table 1). The rates for attempting suicide among colleges students from these countries did not show significant differences compared to the data of 2%[8] and 4%[2] obtained among college students in the U.S. However, the rates for suicidal ideation seemed to be varied widely with the data among American college students; for example, 5.7 % males and 6.1% females,[7] 32%[8] and 19%.[2] respectively. Although the comparative data between Asian and U.S. college students needs to be affirmed using national representative data in the future, it still conveys valuable messages to literature: 1) suicide issues exist among Asian college students as compared to their U.S. counterparts, 2) intervention programs for reducing suicidal ideation and suicide attempts should be designed and carried out among Asian college students in order to prevent future suicide. Maris[32] indicated, "…before one can kill oneself, one must make a suicide attempt."

Although hopelessness has been widely accepted as one of the most critical predictors of suicidal ideation and suicidal behavior in clinical samples[10] there was debate about the relationship between hopelessness and suicidal behavior in non-clinical samples[33]. The significant relationships between hopelessness and suicidal ideation and suicidal behavior have been affirmed by different studies[1,21] among college students and the non-clinical sample. The findings of this study (Table 3) confirmed the predictive effect of hopelessness on suicidal behavior, indicating that sustained sad or hopeless feelings may be a critical factor in predicting suicide among Asian college students as it is among Western college students.[8,10,11] However, results of the study should be interpreted cautiously because the data were not representative of the countries.

After determining the critical effect of hopelessness on suicidal behavior, the following critical question should be answered regarding what leads to hopelessness among college students.[34] The negative life events[21], lowered quality of life, and sustained sad or hopeless feelings may have reciprocal reverse associations. A vicious cycle of these three factors may finally result in suicidal ideation and suicidal behavior. Hypothesis testing from this study suggested that overall quality of life and general health were statistically associated with sustained sad or hopeless feelings and suicidal behavior. Results of t-test and multivariate logistic regressions further affirmed the hypotheses among Chinese and Korean college students, indicating that college students who had a lower level overall quality of life and general health were more likely to have hopeless feelings and display suicidal behavior. However, this hypothesis was only partially supported among Thai college students. Results indicated that Thai college students who had a lower level of overall quality of life and general health were more likely to experience hopeless feelings, but they might not proceed to commit suicide. More researches are needed before this could be clarified.

Each domain of quality of life may contribute to the associations between quality of life and hopelessness and suicidal behavior to some extent. Another related hypothesis tested was that the four domains of WHOQOL-BREF were associated with sustained sad or hopeless feelings and suicidal behavior. Findings of the study confirmed this hypothesis among Chinese and Korean students except that the social domain was not significantly associated with

hopelessness among Korean students (Table 4). As with overall quality of life, only two of the four domains had significant associations with suicidal behavior among Thai college students, although all four domains had significant associations with hopeless feelings in terms of the results of logistic regressions (Table 4).

Compared to openness in expressing feelings and emotions in Western society, Asians are not encouraged to express their feelings to others; instead, they are encouraged to accommodate themselves to circumstance and direct their distress inward.[35] With isolated feelings, people are more likely to be troubled with a mental disorder. Furthermore, physicians and psychiatrists in some Asian countries, e.g. in China, tend to diagnose the psychological problems as physical problems such as neurasthenia; thus timely psychological treatment may not be prescribed to these patients who need it.[35] The differences in cultural background may lead to diversity in perceived social problems.

Although no studies regarding social problem solving have been found between Asians and Americans, Chang[9] found that Asian Americans have higher negative problem orientation and an impulsivity/carelessness than Caucasian Americans. However, little support was found among Asian Americans having greater social problem solving abilities than Caucasian Americans[36], which indicates that Asian populations may need more effective problem solving skills and abilities to preventing suicidal ideation and suicidal behavior. The preliminary findings of this study suggest psychological factors as a common predictor of suicidal ideation and suicidal behaviors among Asian college students since psychological domain was the only variable which showed significant association with sustained sad and hopeless feelings and suicidal behaviors in all three samples. The effect of psychological factors on suicide can be indicated from the mediation of depression. It was found that the predictive effect of hopelessness turned weak when controlling for depression.[10] Konick and Gutierrez[21] regarded depression as a stronger predictor of suicidal behavior in a college student sample and suggested that depressive symptoms lead to hopelessness in a non-clinical sample. This may imply that unhealthy psychological issues may worsen the hopeless feeling and finally result in suicidal ideation and suicidal behavior.

The quality of life and general health status have been shown to link to sustained sadness or hopeless feelings and suicidal behavior among Chinese and Korean students in this study, so the assumption may be made that the low quality of life and poor general health status are predictors of hopelessness and suicidal behavior among these two samples. Since a number of studies have also shown the relationship between hopelessness and suicidal ideation or suicidal behavior[1,10,21], it is worth evaluating the mediating effect of hopelessness between the quality of life and general health status, and suicidal behavior. Findings from this study showed that sustained sad or hopeless feelings fully or partially mediated the influence of the quality of life and general health status on suicidal behavior. The mediating effect of hopelessness may indicate that low quality of life/or poor general health status "serves as the stressful catalyst that launches cognitively vulnerable individuals into a state of hopelessness or into a hopeless depression."[21] The continued worsening quality of life and/or general health status may further enhance the hopeless feelings to develop a suicide plan (suicidal ideation or behavior).[37]

Results of data analysis further indicated that the components of the WHOQOL had strong predictive effects on sustained sad or hopeless feelings and suicidal behavior among Chinese and Korean college students, but not among Thai college students. The overall quality of life, general health, and the four domains were significantly associated with hopeless feelings, but only the psychological health domain were significantly associated with suicidal behavior among Chinese and Korean students. On the other hand, Thai college students who had sustained sad or hopeless feelings did not appear to carry out suicidal behavior. The possible reason that quality of life/general health was not statistically associated with suicidal behavior among Thai college students could be related to religious affiliation. A number of studies have shown the correlation between suicidal behavior and religious affiliation, i.e., religiously affiliated people were less likely to experience suicide attempts.[38,39] In Thailand, approximately 95% of the population declare themselves to be Buddhist and one of the five 'immoral actions' of Buddhism requires a lay-Buddhist to train himself or herself to avoid destroying life.[40] A majority of men in Thailand attain a token monkhood in their lives, usually at the age of 21 years and before marriage. Men usually live in a temple as a monk for three months or longer. Therefore, religious affiliation and practice among Thai people may play an important role in preventing them from suicidal behavior when they encounter hopeless feelings caused by unhappy events in their lives. However, suicidal ideation and behavior still appear among Thai college student.

There may be other factors contributing to suicidal behavior, and more researches are needed for further explanation.

The findings of this study must be considered in light of its limitations. First, the small and convenient samples in this study limit the generalization of the findings to other groups of population. Second, some important factors related to the suicide among colleges students were not included in the study, such as religion,[39] school achievement,[41] and competition.[42] Third, only one item instead of a more standard scale was used to assess the hopelessness for suicide behavior in the present study. This may not be enough to examine all the dimensions of hopelessness among college students. It is recommended that the standard hopelessness scales such as the Beck Hopelessness Scale[43] be incorporated with the WHOQOL-BREF in the future to better understand the effect of hopelessness on suicidal ideation and behavior among Asian college students.

Despite of the limitations, there are several implications from these findings. First, although the findings of this study were based on a self-reported survey and it was not consistent between countries, it revealed some existing suicide problems among college students in Asian countries and it indicated a need for more research in the future.

Second, this preliminary study revealed that accumulation of daily unresolved dissatisfaction may lead to serious negative life events which may further lead to suicidal ideation and suicidal behavior. The WHOQOL-BREF instrument can be used to monitor the negative responses of college students in Asian countries and their status in physical health, social relationships, psychological health, and environmental health for prevention of more serious negative life events.

Third, counseling is beneficial to help depressed college students reduce their suicidal ideation, but counseling services in Asian colleges are less available than in Western colleges. Furthermore, Asian college students are less likely to seek professional counseling services regardless of their obvious needs for those services.[44] Therefore, it is recommended that 1) more campus counseling services should be provided to meet the needs of Asian college students for managing mental and psychological problems, 2) more education, outreach, and media campaigns should be conducted to inform students about mental health issues, and to encourage them seeking professional help before suicidal ideation and suicidal behavior occurred. Fourth, more culture and religion related variables should be included to further examine the predictors of suicidal ideation and suicidal behavior in different cultural and religious backgrounds.

In summary, this study may improve knowledge about suicidal behavior among college students in Asian countries. Findings of this preliminary study may help university administrators and health educators in Asian countries better understand the effects of quality of life on suicide attempts, and encourage them to develop suicide prevention and intervention programs to help students improve coping skills.

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Table 1. Negative feeling, suicide ideation, and suicidal behavior in 3 countries

	China (%) N=311	Thailand (%) N=407	Korea (%) N=499	χ^2	*df*	*p*
Sustained sad or hopeless feelings						
Yes	14.8	13.3	22.8	16.4	2	<.001
No	85.2	86.7	77.2			
Ever seriously considered attempting suicide						
Yes	4.2	1.5	11.6	42.2	2	<.001
No	95.8	98.5	88.4			
Made a plan about how to attempt suicide						
Yes	4.9	2.7	4.6	2.83	2	0.243
No	95.1	97.3	95.4			
Attempt suicide						
Once or more	4.5	1.0	2.4	9.09	2	0.011
Never	95.5	99.0	97.6			
Suicidal behavior						
Yes	10.0	3.7	13.2	24.71	2	<.001
No	90.0	96.3	86.8			

Table 2. Mean differences in overall quality of life, general health, and four domains in terms of sustained sad or hopeless feelings and suicidal behavior in 3 countries

		Sustained sad or hopeless feelings				Suicidal behavior (%)			
		Yes(SD)	No(SD)	*t* (*df*)	Cohen's *d*	Yes(SD)	No(SD)	*t* (*df*)	Cohen's *d*
China	Overall QoL [b]	2.67(0.79)	3.40(0.78)	*t* (309) = -5.86***	-0.89	2.67(0.74)	3.37(0.80)	*t* (304) = -4.84***	-0.89
	General health	2.87(0.91)	3.57(0.81)	*t* (309) = -5.29***	-0.81	2.79(0.89)	3.55(0.83)	*t* (304) = -4.98***	-0.88
	Physical	11.29(2.16)	13.35(1.98)	*t* (309) = -6.42***	-0.99	11.13(2.58)	13.30(1.93)	*t* (304) = -5.85***	-0.95
	Psychological	11.68(3.09)	13.38(1.93)	*t* (309) = -3.60*** [a]	-0.66	11.45(3.47)	13.32(1.92)	*t* (36.5) = 3.04*** [a]	-0.67
	Social	11.89(3.38)	14.57(2.74)	*t* (309) = -5.89***	-0.88	12.04(3.54)	14.45(2.83)	*t* (304) = -4.50***	-0.75
	Environment	10.22(2.93)	12.69(2.44)	*t* (309) = -5.41*** [a]	-0.94	10.95(3.52)	12.50(2.50)	*t* (36.0) = -2.44** [a]	-0.51
Thailand	Overall QoL [b]	3.35(0.87)	3.72(0.65)	*t* (405) = -3.71***	-0.39	3.56(0.71)	3.68(.69)	*t* (405) = -0.74	-0.17
	General health	3.30(0.92)	3.62(0.76)	*t* (62.3) = -2.48** [a]	-0.36	3.44(0.62)	3.59(.80)	*t* (405) = -0.74	-0.21
	Physical	12.36(1.42)	12.85(1.54)	*t* (405) = -2.22*	-0.34	12.57(1.00)	12.80(1.55)	*t* (405) = -0.61	-0.18
	Psychological	13.11(2.00)	14.43(1.55)	*t* (63.1) = -4.66*** [a]	-0.74	13.33(1.51)	14.29(1.67)	*t* (405) = -2.81**	-0.60
	Social	14.12(2.74)	15.10(2.33)	*t* (65.3) = -2.50* [a]	-0.40	14.67(2.33)	14.99(2.41)	*t* (405) = -0.55	-0.14
	Environment	12.93(2.06)	14.25(1.88)	*t* (405) = -4.77***	-0.70	12.72(2.16)	14.14(1.93)	*t* (405) = -3.04**	-0.69

Table 2 continued

	Overall QoL [b]	3.34(0.69)	3.52(0.65)	*t* (497) = -2.50*	-0.30	3.28(0.67)	3.51(0.65)	*t* (497) = -2.60**	-0.35
	General health	2.97(0.85)	3.30(0.83)	*t* (497) = -3.67***	-0.36	2.97(0.90)	3.27(0.83)	*t* (497) = -2.68**	-0.35
Korea	Physical	11.71(1.94)	12.10(1.68)	*t* (497) = -2.09*	-0.22	11.38(1.97)	12.11(1.70)	*t* (497) = -3.16**	-0.40
	Psychological	12.16(1.80)	12.67(1.59)	*t* (168.4) = -2.69** [a]	-0.29	11.85(2.01)	12.66(1.57)	*t* (78.9) = -3.16** [a]	-0.45
	Social	12.63(2.52)	12.87(2.29)	*t* (497) = -0.95	-0.12	12.22(2.45)	12.91(2.32)	*t* (497) = -2.24*	-0.29
	Environment	11.06(1.94)	11.86(1.96)	*t* (497) = -3.90***	-0.41	10.84(1.92)	11.81(1.96)	*t* (497) = -3.77***	-0.50

Notes: [a] Equal variances were not assumed based on Levene's test for equality of variances. The robust t values and adjusted degree of freedom were used.

[b] Overall quality of life.

Table 3. Bivariate associations between suicidal behavior and sustained sad or hopeless feelings

	Suicidal Behavior (%)														
	China					Thailand					Korea				
	Yes (%)	No (%)	χ^2	*df*	*p*	Yes (%)	No (%)	χ^2	*df*	*p*	Yes (%)	No (%)	χ^2	*df*	*p*
Sustained sad or hopeless feelings															
Yes	60.6	9.2	62.13	1	<.001	55.6	11.3	29.27	1	<.001	55.2	17.8	46.03	1	<.001
No	39.4	90.8				44.4	88.7				44.8	82.2			

Table 4. Multivariate logistic regression analysis of sustained sad or hopeless feelings among Chinese, Thai and Korean students

	Chinese students (Yes=46, No=265) [a]		Thai students (Yes=54, No=353) [a]		Korean students (Yes=114, No=385) [a]	
	AOR	95%CI	AOR	95%CI	AOR	95%CI
Overall quality of life						
Very poor or poor	28.46***	6.90-117.4	9.91***	2.79-35.17	3.04*	1.30-7.09
Neither poor or good	5.92**	1.75-19.98	2.39**	1.28-4.47	1.62*	1.04-2.52
Good or very good	1.0	Reference	1.0	Reference	1.0	Reference
General Health						
Very dissatisfied or dissatisfied	8.95***	3.40-23.61	2.59*	1.04-6.45	1.57***	1.57-4.54
Neither satisfied nor dissatisfied	3.45**	1.55-7.72	2.79*	1.47-5.32	0.74	0.74-2.07
Satisfied or very satisfied	1.0	Reference	1.0	Reference	1.0	Reference
Physical	0.61***	0.51-0.74	0.81*	0.67-0.99	0.88*	0.78-0.99
Psychological	0.73***	0.63-0.84	0.63***	0.52-0.75	0.83**	0.73-0.95
Social	0.73***	0.64-0.83	0.85*	0.76-0.97	0.95	0.86-1.04
Environment	0.70***	0.61-0.80	0.70***	0.60-0.83	0.82***	0.73-0.91

Notes. AOR=adjusted odds ratio, CI=confidence interval.

[a] Adjusted for gender, age groups and class standings.

*p<.05, **p<.01, *** p<.001.

Table 5. Multivariate logistic regression analysis of suicidal behavior among Chinese, Thai and Korean students

	Chinese students (Yes=31, No=278) [a]		Thai students (Yes=15, No=392) [a]		Korean students (Yes=66, No=433) [a]	
	AOR	95%CI	AOR	95%CI	AOR	95%CI
Overall quality of life						
Very poor or poor	33.87***	6.52-176.1	-	-	3.32*	1.16-9.54
Neither poor or good	5.13*	1.16-22.64	-	-	2.55**	1.43-4.56
Good or very good	1.0	Reference	-	-	1.0	Reference
General Health						
Very dissatisfied or dissatisfied	13.29***	4.41-40.05	-	-	2.17*	1.15-4.11
Neither satisfied nor dissatisfied	2.78*	1.01-7.76	-	-	0.93	0.48-1.80
Satisfied or very satisfied	1.0	Reference	-	-	1.0	Reference
Physical	0.63***	0.52-0.77	0.98	0.66-1.46	0.78**	0.67-0.91
Psychological	0.73***	0.63-0.85	0.71*	0.51-0.98	0.74***	0.63-0.88
Social	0.76***	0.67-0.87	0.91	0.73-1.14	0.87*	0.77-0.98
Environment	0.79***	0.69-0.91	0.75	0.56-1.00	0.80**	0.70-0.92

Notes. AOR=adjusted odds ratio, CI=confidence interval.

[a] Adjusted for gender, age groups and class standings.

*p<.05, **p<.01, *** p<.001.

Table 6. Evaluate sustained sad or hopeless feelings as a mediator in the multivariate logistic regression analysis of suicidal behavior among Chinese, Thai and Korean students

	Chinese students (Yes=31, No=278) [a]		Korean students (Yes=66, No=433) [a]	
	AOR	95%CI	AOR	95%CI
Overall quality of life				
Very poor or poor	12.59**	2.08-76.21	2.33	0.77-7.10
Neither poor or good	3.46	0.72-16.69	2.23**	1.22-4.08
Good or very good	1.0	Reference	1.0	Reference
General Health				
Very dissatisfied or dissatisfied	6.65**	1.91-23.07	1.58	0.80-3.12
Neither satisfied nor dissatisfied	1.71	0.67-5.15	0.87	0.44-1.73
Satisfied or very satisfied	1.0	Reference	1.0	Reference

Notes. AOR=adjusted odds ratio, CI=confidence interval.

[a] Adjusted for gender, age groups, class standings, and sustained sad or hopeless feelings.

**p<.01.