PERSONAL AND INTERPERSONAL FACTORS RELATED TO SUICIDAL IDEATION AMONG RURAL VIETNAMESE ADOLESCENTS

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Abstract. The purpose of this study was to explore the level of suicidal ideation and its personal, peer- and family-related factors among rural Vietnamese adolescents. A self-administered survey was conducted with 171 students from two middle schools in two communes of Quang-Tri Province in Vietnam. Suicidal ideation and risk factors were measured using the Vietnamese version of the World Health Organization (WHO) Global School-based Student Health Survey (GSHS). The data were analyzed by chi-square test and logistic regression analysis. The prevalence of suicidal ideation was 14.2%, and no gender differences were found. The major risk factors associated with suicidal ideation were feelings of loneliness, having no close friends, and parental drinking. The findings suggest that student interpersonal skills, and family and community involvement are key considerations for the development of a suicide prevention program for this population. Further research is suggested to develop and evaluate a school-based culturally adaptive suicide prevention program.

Keywords: suicidal ideation, close friends, loneliness, parental drinking, Vietnamese adolescents

INTRODUCTION

Suicidal behaviors of adolescents are a major global health issue. These behaviors are the major causes of death and influence their mental health in adulthood as well as the mental health of their family and community members. According to the World Health Organization (WHO, 2014a), suicide was ranked the second most common cause of death among people aged 15-29 years. Suicide rates were higher in middle-low income countries (41.4%) than those in low-income countries (10.2%) and high-income countries (24.5%). Also, suicide rates of adolescents and young adults were higher in Southeast Asia than those of other regions. Females show slightly higher tendencies than males (28 females/100 thousand *vs* 21 males/100 thousand) (WHO, 2014b), and rates are greater in urban areas compared

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to rural areas (McLoughlin *et al*, 2015). This evidence indicates that the developing countries in Asia have increased needs for developing policies and implementing solutions for the prevention of suicide in adolescents.

Suicidal behavior can be categorized into three categories: suicidal ideation, suicide attempts, and completed suicide (Sandin *et al*, 1998). Suicidal ideation indicates the thought of self-injury or suicide (O'Carroll *et al*, 1996). Suicidal ideation of adolescents was found to be more frequent among females than males, unlike the other suicidal behaviors (McLoughlin *et al*, 2015). According to previous studies, suicidal ideation during adolescence is a risk factor leading to mental health problems in adulthood; it is also a predictive factor of suicidal attempts or suicide (Reinherz *et al*, 2006; Kerr, 2008). While suicidal ideation does not necessarily lead to suicide attempts (Simons and Murphy, 1985), many adolescents who entertain the thought of suicide (suicidal ideation) attempt suicide (Nock *et al*, 2013). Therefore, exploring the risk factors related to suicidal ideation during adolescence is an essential preceding phase for the development of a suicide prevention intervention program.

In Vietnam, the prevalence of suicidal ideation among adolescents aged from 14 to 19 years old doubled from 5.28% in 2000-2004 to 12.21% in 2009-2010 (Le *et al*, 2012). Moreover, in the Global School-based Student Health Survey (GSHS) conducted in 2013 with adolescents aged from 13 to 17 years old, the prevalence of suicidal ideation increased to 16.9% (WHO, 2013a). This was higher than that of adjacent countries including Cambodia, where the rate was 6.2% (WHO, 2013c), and Thailand with a rate of 12.5% (WHO, 2015).

Conversely, the prevalence of suicidal ideation of Vietnamese students aged 16-17 years was 19.9%, which was higher than the students aged 13-15 years (14.0%) (WHO, 2013a). In the case of high school students, it was as high as 26.3% in some areas (Nguyen *et al*, 2013), which suggests that mental health problems tend to get more severe as the adolescents grow older. Moreover, in these studies, the prevalence of suicidal ideation of middle and high school girls in Vietnam was 20.8%, which was 2.3 times higher than that of boys (12.5%) (Nguyen *et al*, 2013; WHO, 2013a), showing a gap between genders.

Suicidal ideation of adolescents is related to personal factors, such as emotional status and health risk behaviors. According to studies that examined adolescents of the Asian countries, suicidal ideation was related to personal mental health states, such as anxiety and stress (Ahmad *et al*, 2014), depression (Ahmad *et al*, 2014; Ibrahim *et al*, 2014) among Malaysian adolescents, and feelings of sadness among Thailand adolescents (Peltzer and Pengpid, 2012).

Moreover, adolescent health risk behaviors, such as drug use, and smoking and alcohol use were related to suicidal behaviors in Korean adolescents (Park, 2008). In addition, suicidal behaviors appeared to occur in conjunction with other health risk behaviors rather than alone (King *et al*, 2001; Rao *et al*, 2015). Conversely, health risk behaviors of Thailand adolescents, such as smoking, illicit drug use, physical inactivity, obesity, bully victimization, and truancy appeared to have no relation with suicidal ideation (Peltzer and Pengpid, 2012). These data show that previous research results are not consistent, and this suggests that further studies that examine the relationship between various health risk behaviors and suicidal ideation among adolescents are needed.

Peer-related factors such as bullying

(Geoffroy *et al*, 2016) and absence of close friends (Ahmad *et al*, 2014; Rao *et al*, 2015) increased suicidal ideation in some studies. However, another study suggested that bullying was not related to suicidal ideation (Peltzer and Pengpid, 2012). In addition, suicidal ideation was linked to family-related risk factors: experience of family violence (Le *et al*, 2012; Nguyen *et al*, 2013), low parental understanding of adolescents (Rao *et al*, 2015), low parental attachment (Peltzer and Pengpid, 2012), lower family cohesion (Le *et al*, 2012), and less parental support (Blum *et al*, 2012). In addition to personal factors, the findings from earlier studies suggest a close link between adolescents' suicidal ideation and interpersonal relationships with their peers and family. Also, interpersonal factors differ between each region due to differing social and cultural environments.

To our knowledge, a considerable portion of Vietnamese adolescents experience suicidal ideation, and females show a higher risk of suicidal ideation than males do. However, it is unclear what factors influence suicidal ideation among rural Vietnamese adolescents. Therefore, the purpose of this study was to explore the prevalence of suicidal ideation among Vietnamese rural adolescents and its personal, and peer- and family-related factors.

MATERIALS AND METHODS

Study design and samples

This study used a cross-sectional study design and was conducted in Trieu Trach Commune and Hai Thuong Commune located in the Quang Tri Province, which is in the middle region of Vietnam. This is also where the global development project 'Vietnam Quang Tri Happiness Program' was implemented. A commune is composed of the minimum unit of administrative districts. At the time of data collection, the population of Trieu Trach Commune was 6,853, and the population of Hai Thuong Commune was 5,847. Most of the residents were working in agriculture. The average annual household incomes of the two communities were USD 1,289 and 1,380, respectively.

Each of the two communes had one middle school. A total of 171 sixth graders from the middle schools participated in the survey after written consents were obtained from the students and their parents for research participation. Two questionnaires were excluded for having incomplete answers, and 169 questionnaires were used in the final analysis.

Instruments

Research variables were measured with the GSHS questionnaire items developed by the WHO for examination of the health behaviors of adolescents. The GSHS has been used for research on health behavior of 13-17 year old adolescents in various countries. The Vietnamese version of the questionnaire is provided online (WHO, 2013b).

Two professors of the local medical college confirmed the appropriateness of the GSHS item for middle school sixth graders for this study, and it was used without alteration. Suicidal ideation was measured with a dichotomous scale (Yes/No) for the single item, 'During the past 12 months, did you ever seriously consider attempting suicide'?

Major variables included: 'personal factors' (gender, present smoking, present drinking, eating fruits, eating vegetables, drinking soda, eating fast food, exercise, feeling lonely, and worried about something), 'peer-related factors' (physical attack, physical fighting, bullying, close friends, friends drinking, and kindness

and helpfulness of students), and 'family-related factors' (parental drinking, checking homework by parents, understanding problems and worries with parents' help, having free time from parents, doing something without parents' approval, giving advice and guidance by parents, expecting too much by parents, and parents respecting the student as a person).

Data collection and analysis

The data collection period of this study was during May 4-18, 2015. Trained Vietnamese researchers explained the study purpose and contents and instructed students how to complete the self-reporting questionnaires. When there was difficulty in understanding, the students could ask questions to the Vietnamese researchers. It took about 30 minutes to complete the questionnaires, and the questionnaires were collected immediately upon completion.

After the survey, the researchers provided a group health education for hand washing and distributed hand sanitizers as compensation for their time and effort.

The collected data were analyzed with SPSS® (version 23.0; IBM, Armonk, NY). First, frequency and percentage of the personal, peer- and family-related factors of subjects were calculated. Second, the difference of whether there was a suicidal ideation per each of the personal, peer- and family-related factors was analyzed with the chi-square test. Third, this study employed logistic regression analysis to assess the factors affecting suicidal ideation.

Ethical consideration

This study was approved by the Institutional Review Board (IRB) of Yonsei University College of Nursing (IRB No. IRB 2015-0012-1; 04/29/15). The researchers visited the target middle schools and explained the necessity and purpose of this study to the principal and the teachers who provided approval.

Letters were sent to the students and parents to obtain written consent for the study participation. The letters explained the study, guaranteed anonymity and explained that participation was voluntary. The letter explained that the participants could withdraw from the study at any time if they did not want to participate, and also included the study contents that would be used for research purposes only.

RESULTS

Characteristics of subjects

Most subjects were 12 years old (95.9%) and a little over half were female (51.5%). Ninety-three participants (55%) were from the Trieu Trach Commune compared to the Hai Thuong Commune (n=76, 45%). Most students did not smoke or drink alcohol (98.8% and 93.5%, respectively). Students who consumed fruits and vegetables at least once a day accounted for 82.2% and 91.7% of the total students, respectively. Sixty point nine percent of students ate fast food in the prior seven days. A total of 58.0% of the students exercised for at least 60 minutes up to four days per week, and 88.7% of the students appeared to have never or rarely worried about anything for the previous 12 months.

Prevalence of suicidal ideation by personal factors

Fourteen point two percent (14.6% of male, 13.8% of female) of the subjects thought seriously of suicide during the previous 12 months. The subjects' prevalence of suicidal ideation by personal factors is shown in Table 1. There were no statistically significant differences in personal factors with the exception of feeling lonely. About 41.7% of the stu-

Table 1
Prevalence of suicidal ideation by personal factors (N=169).

Variable	Suicidal ideation, n(%)			χ^2(p-value)
	Total (N=169)	No (n=145)	Yes (n=24)	
Gender				
Male	82 (48.5)	70 (48.3)	12 (50.0)	0.02(>0.999)
Female	87 (51.5)	75 (51.7)	12 (50.0)	
Present smoking				
No	167 (98.8)	144 (99.3)	23 (95.8)	2.13 (0.265)[a]
Yes	2 (1.2)	1 (0.7)	1 (4.2)	
Present drinking				
No	158 (93.5)	137 (94.5)	21 (87.5)	1.65 (0.367)[a]
Yes	11 (6.5)	8 (5.5)	3 (12.5)	
Eating fruits in the last 30 days				
< once a day	30 (17.8)	26 (17.9)	4 (16.7)	0.02 (>0.999)[a]
≥ once a day	139 (82.2)	119 (82.1)	20 (83.3)	
Eating vegetables in the last 30 days				
< once a day	14 (8.3)	12 (8.3)	2 (8.3)	0.00 (>0.999)[a]
≥ once a day	155 (91.7)	133 (91.7)	22 (91.7)	
Drinking soda in the last 30 days				
< once a day	87 (51.5)	79 (54.5)	8 (33.3)	3.69 (0.077)
≥ once a day	82 (48.5)	66 (45.5)	16 (66.7)	
Eating fast food in the last 7 days				
Not eaten	103 (60.9)	87 (60.0)	16 (66.7)	0.39 (0.653)
Eaten more than once	66 (39.1)	58 (40.0)	8 (33.3)	
> 60 min exercise in the last week				
≤ 4 days	98 (58.0)	85 (58.6)	13 (54.2)	0.17 (0.824)
≥ 5 days	71 (42.0)	60 (41.4)	11 (45.8)	
Feelings of loneliness				
Never or rarely	130 (76.9)	116 (80.0)	14 (58.3)	7.76 (0.017)
Sometimes	33 (19.5)	26 (17.9)	7 (29.2)	
Most of time or always	6 (3.6)	3 (2.1)	3 (12.5)	
Worried about something[b]				
Never or rarely	149 (88.7)	130 (89.7)	19 (82.6)	3.02 (0.284)
Sometimes	17 (10.1)	14 (9.7)	3 (13.0)	
Most of time or always	2 (1.2)	1 (0.7)	1 (4.3)	

[a]Fisher's exact test; [b]Missing data.

dents who experienced suicidal ideation sometimes or always felt lonely in the last 12 months, which was statistically twice as high (χ^2=7.76, p=0.017) as the students without suicidal ideation (20.0%).

Prevalence of suicidal ideation by peer-related factors

The subjects' prevalence of suicidal ideation by peer-related factors is shown in Table 2. A statistically significant differ-

Table 2
Prevalence of suicidal ideation by peer-related factors (N=169).

Variable	Suicidal ideation, n(%)			χ^2(p-value)
	Total (N=169)	No (n=145)	Yes (n=24)	
Physically attacked in the last 12 months				
Not attacked	84 (49.7)	77 (53.1)	7 (29.2)	4.72 (0.046)
≥ once	85 (50.3)	68 (46.9)	17 (70.8)	
Physical fighting				
No physical fights	105 (62.1)	95 (65.5)	10 (41.7)	4.98 (0.039)
≥ once	64 (37.9)	50 (34.5)	14 (58.3)	
Bullied				
Not bullied	105 (62.1)	94 (64.8)	11 (45.8)	3.16 (0.110)
≥ once	64 (37.9)	51 (35.2)	13 (54.2)	
Having close friends				
No	6 (3.6)	3 (2.1)	3 (12.5)	6.54 (0.038)[a]
Yes	163 (96.4)	142 (97.9)	21 (87.5)	
Peers' drinking				
No	127 (75.1)	114 (78.6)	13 (54.2)	6.59 (0.014)
Yes	42 (24.9)	31 (21.4)	11 (45.8)	
Peers' kindness and helpfulness[b]				
Never or rarely	36 (21.6)	30 (20.8)	6 (26.1)	5.14 (0.076)[a]
Sometimes	60 (35.9)	48 (33.3)	12 (52.2)	
Most of time or always	71 (42.5)	66 (45.8)	5 (21.7)	

[a]Fisher's exact test; [b]Missing data.

ence in the prevalence of suicidal ideation was associated with whether there was a physical attack, a physical fight, presence of close friends, and friends drinking. Seventy point eight percent of the students with suicidal ideation had at least one experience of physical attack during the last 12 months, which was significantly higher than the case of students without suicidal ideation (46.9%) (χ^2=4.72, p=0.046). Moreover, 58.3% of the students thinking of suicide experienced at least one physical fight during the last 12 months, which was significantly higher than the students who did not think of suicide, 34.5%, (χ^2=4.98, p=0.039). Ninety-seven point nine percent of students without suicidal ideation had close friends, which was significantly higher than the students with suicidal ideation (87.5%) (χ^2=6.54, p=0.038). In addition, 45.8% of the students with suicidal ideation had friends who drink alcohol, which was significantly higher than the 21.4% of the students without suicidal ideation (χ^2=6.59, p=0.014).

Prevalence of suicidal ideation by family-related factors

The subjects' prevalence of suicidal ideation by family-related factors is shown in Table 3. Looking into the health behaviors of parents, 79.2% of the students with suicidal ideation had parents who drank, which was significantly higher than students without suicidal ideation (48.3%, χ^2=7.40, p=0.019). The other family-related factors did not show

Table 3
Prevalence of suicidal ideation by family-related factors (N=169).

Variable	Suicidal ideation, n(%)			χ^2(p-value)
	Total (N=169)	No (n=145)	Yes (n=24)	
Parental drinking				
No	59 (34.9)	55 (37.9)	4 (16.7)	7.40 (0.019)[a]
Yes	89 (52.7)	70 (48.3)	19 (79.2)	
Don't know	21 (12.4)	20 (13.8)	1 (4.2)	
Checking homework by parents[b]				
Never or rarely	43 (26.1)	35 (24.6)	8 (34.8)	3.04 (0.213)
Sometimes	44 (26.7)	36 (25.4)	8 (34.8)	
Most of time or always	78 (47.3)	71 (50.0)	7 (30.4)	
Understanding problems and worries[b]				
Never or rarely	55 (32.9)	47 (32.6)	8 (34.8)	1.03 (0.656)
Sometimes	43 (25.7)	39 (27.1)	4 (17.4)	
Most of time or always	69 (41.3)	58 (40.3)	11 (47.8)	
Having free time from parents[b]				
Never or rarely	43 (25.9)	39 (27.3)	4 (17.4)	1.22 (0.532)
Sometimes	51 (30.7)	44 (30.8)	7 (30.4)	
Most of time or always	72 (43.4)	60 (42.0)	12 (52.2)	
Doing something without parental approval				
Never or rarely	128 (75.7)	113 (77.9)	15 (62.5)	3.26 (0.180)[a]
Sometimes	21 (12.4)	17 (11.7)	4 (16.7)	
Most of time or always	20 (11.8)	15 (10.3)	5 (20.8)	
Receiving advice and guidance from parents				
Never or rarely	20 (11.8)	19 (13.1)	1 (4.2)	5.38 (0.064)[a]
Sometimes	56 (33.1)	43 (29.7)	13 (54.2)	
Most of time or always	93 (55.0)	83 (57.2)	10 (41.7)	
Too much parental expectations				
Never or rarely	14 (8.3)	10 (6.9)	4 (16.7)	2.88 (0.202)[a]
Sometimes	24 (14.2)	22 (15.2)	2 (8.3)	
Most of time or always	131 (77.5)	113 (77.9)	18 (75.0)	
Respected by parents				
Never or rarely	15 (8.9)	13 (9.0)	2 (8.3)	1.59 (0.442)[a]
Sometimes	17 (10.1)	13 (9.0)	4 (16.7)	
Most of time or always	137 (81.1)	119 (82.1)	18 (75.0)	

[a]Fisher's exact test; [b]Missing data.

statistically significant differences in the subjects' suicidal ideation.

Factors affecting the adolescent suicidal ideation

This study conducted logistic regression analysis to identify the factors influencing the suicidal ideation of the Vietnamese rural adolescents and the results are shown in Table 4. The independent variables that showed a significant difference in the univariate analysis included feelings of loneliness, friend(s) who drink

Table 4
Factors affecting suicidal ideation (*N*=169).

Variable	OR (95% CI)	*p*-value
Personal factors		
Gender		
Male[a]		
Female	1.66 (0.58-4.90)	0.326
Feeling lonely		
Never or rarely[a]		
Sometimes	1.37 (0.42-4.50)	0.597
Most of time or always	8.82 (1.08-71.85)	0.042
Peer factors		
Friends' drinking		
No[a]		
Yes	2.94 (0.98-8.77)	0.053
Physical fighting		
No[a]		
Yes	1.92 (0.64-5.72)	0.238
Having close friends		
Yes[a]		
No	12.46 (1.14-109.41)	0.023
Physically attacked		
No[a]		
Yes	2.24 (0.70-7.12)	0.171
Family factors		
Parents drinking		
No[a]		
Yes	3.72 (1.04-13.35)	0.044
Don't know	0.81 (0.07-8.98)	0.870

[a]Reference group; OR, Odds ratio; CI, Confidence interval.

alcohol, having close friends, fighting, physical attack, and parental drinking. Furthermore, gender was also included as a factor, as suggested by previous studies (Nguyen *et al*, 2013; WHO, 2013a).

Among personal factors, the adolescents' feelings of loneliness 'most of the time' or 'always' had a statistically significantly higher risk than those feeling loneliness 'never' or 'rarely' (OR=8.82; 95% CI: 1.08-71.85). Among the peer-related factors, adolescents having no close friends appeared to have higher risk of suicidal ideation than those with close friends (OR=12.46; 95% CI: 1.14-109.41). Among family-related factors, the adolescents whose parents drank alcohol had a higher risk of suicidal ideation than those whose parents did not drink (OR=3.72; 95% CI: 1.04-13.35). For verification of the model's appropriateness, this study employed Hosmer-Lemeshow verifications. The result showed that the logistic regression analysis was acceptable with

p=0.543. The Nagelkerke R^2 value of the model was 0.282.

DISCUSSION

This study indicated that the prevalence of suicidal ideation of adolescents of the Vietnamese rural area was 14.2%. This is similar to the Vietnamese nationwide survey result, which showed 14.0% of suicidal ideation prevalence among 13-15 years old subjects (WHO, 2013a). However, subjects of this study were 12 years old, which is the early age of adolescence, so the prevalence of suicidal ideation is meaningful. According to previous research, the prevalence of suicidal ideation during adolescence tends to increase with age.

In a study with 6,483 adolescents in the United States, the prevalence of suicidal ideation was negligible up to 12 years old, but from this age it began to increase considerably (Nock *et al*, 2013). Vietnamese adolescents showed a similar tendency: the prevalence of suicidal ideation of 16-17 year old adolescents (19.9%) was 1.4 times higher than those of 13-15 year olds (14.0%) (WHO, 2013a). In a study of 10-12th grade Vietnamese high school students (15-19 years old), the prevalence of suicidal ideation was as high as 26.3% (Nguyen *et al*, 2013). Considering the characteristics of the adolescence period when there is high stress due to interpersonal relationships with peers and parents as well as stress from school and puberty development, it is possible that the prevalence of suicidal ideation may increase when no appropriate intervention is provided.

In this study, there was no significant difference in the prevalence of suicidal ideation by gender. This result is in agreement with a recent study that examined adolescents of six Asian countries (China, Indonesia, Myanmar, Philippines, Sri Lanka, and Thailand), which also showed no difference in the prevalence of suicidal ideation by gender (Swahn *et al*, 2014). However, in low-middle income countries, female adolescents are likely to show higher suicide rates than male adolescents. In developing countries of Asia, particularly in China and India, the difference due to gender was considerable (McLoughlin *et al*, 2015), and this result requires further exploration. In a previous national survey of Vietnamese adolescents, 13-15 year-old female adolescents showed a prevalence of suicidal ideation which was 1.5-times higher than males (WHO, 2013a). In the case of 16-17 year olds, it was 1.8 times higher (WHO, 2013a). In a study that analyzed the risk factors of suicidal ideation, 15-24 year old Vietnamese females living in Hanoi showed a 2.8 times higher risk of suicidal ideation than males (Blum *et al*, 2012). In another study with Vietnamese high school students in a different area, the suicidal ideation of females appeared to be 2.3 times higher than males (Nguyen *et al*, 2013). Such differences could be interpreted as due to changes brought about with globalization and economic development (the intense competition for jobs) and increased risk of female exposure to family violence (Le *et al*, 2012). Considering the socio-economic weakness of females in rural areas, there seems to be a high possibility that these adolescents are more often exposed to suicidal ideation risk factors. Therefore, further in-depth analyses are suggested related to factors that lead to suicidal ideation by gender in the sociocultural context of Vietnamese rural areas.

The Interpersonal Theory of Suicide (Van Orden *et al*, 2010), focusing on the

desire for interpersonal relationships, hypothesizes that thwarted belongingness (loneliness, lack of social support) and perceived burdensomeness (family conflict, unemployment, diseases) are conceptualized as frustration of the desire for interpersonal relationships, and as such, could sufficiently lead to suicidal ideation. As a result of this study, the suicidal ideation of adolescents appeared to have been most strongly influenced by loneliness and the perception of having close friends, which supported the assumptions of the Interpersonal Theory of Suicide. This result is also compatible with previous studies that examined these principles in other Asian countries (Ahmad *et al*, 2014; Rao *et al*, 2015).

One such study in Vietnam also showed similar results, determining that adolescents who strongly recognized school connectedness, intimacy with peers, safeness of the school environment, and happiness showed less tendency of suicidal ideation (Phuong *et al*, 2013). In a meta-analysis that examined the factors related to suicidal ideation in Korean adolescents, peer relationship stress was found to be a risk factor of suicidal ideation, while peer relationship intimacy was found to be a protective factor (Kim and Lee, 2009). Likewise, adolescence is a period that is most strongly affected by friends; therefore, obtaining skills for healthy interpersonal relationship development would affect their social health in adulthood. In this regard, further research for the development and application of programs to improve peer relationships and school connectedness of Vietnamese rural adolescents is suggested.

Adolescents spend most of their time at school, therefore school-based health programs are recommended. Moreover, evidence has confirmed the effectiveness of health promotion in adolescence. A systematic review (Langford *et al*, 2014) showed that the school health promotion framework of the WHO, which includes a health education curriculum, education regarding socio-physical environmental changes at school, and participation of family and community, was effective at increasing the physical activity of students and the reduction of smoking and bullying.

Another systematic review of school-based prevention and treatment programs for suicide-related behaviors (Robinson *et al*, 2013) showed an increase in knowledge related to suicide and mental health, an increase in positive attitude, and an increase in behavior asking for help for themselves or friends. Other results of a systematic review (Bennett *et al*, 2015) were also similar, suggesting that school-based suicide prevention programs should be centered on suicide awareness, plus screening and skills training. Moreover, it should not be overlooked that school-based health programs have an impact not only on students, but also on their families and community.

In Pakistan, through the adolescents who had participated in a school-based mental health program, the recognition of mental health of their parents, neighbors, and friends not going to the school were improved (Rahman *et al*, 1998). For developing countries, where health information and service accessibility are limited, schools are key sites for community health promotion and can serve as links between school-aged children and the community. Altogether, these results emphasize the necessity of a school-based program educating Vietnamese adolescents on suicidal ideation risk factors.

Among family-related risk factors related to suicidal ideation of adolescents,

when parents drank alcohol, the risk of suicidal ideation was higher than those who did not. This could be because the parents' drinking leads to an increase in domestic violence, conflict, and stress among family members. In this regard, this study result partially supports previous studies (Kim and Lee, 2009; McLoughlin *et al*, 2015), which indicated a relationship between suicidal ideation of adolescents and negative family relationships.

The association between parents' drinking and domestic violence was consistently found in previous studies. In one study, a husband's alcohol use appeared to increase the risk of violence towards the wife and other forms of family abuse (Wagman *et al*, 2016). Moreover, parental abuse tends to increase suicidal ideation of Vietnamese adolescents (Nguyen *et al*, 2013). Therefore, a program reducing parents' drinking should be strongly considered. Indeed, alcohol use in Vietnam is a problem that resulted from the development of more distinct national socioeconomic levels and has led to an increase in chronic diseases, traffic accidents, and domestic violence (Lincoln, 2016).

In Vietnamese culture, alcohol is considered part of a traditional meal; it is expected at important events, and it is an expression of friendliness towards important guests (Luu *et al*, 2014). As mentioned above, parental drinking behavior is a risk factor of suicidal ideation in children, and therefore the adolescent suicide prevention program should encompass parents and community-level interventions for reducing parental heavy drinking behaviors.

In conclusion, the prevalence of suicidal ideation among Vietnamese rural adolescents appeared to be close to the national average. Although there was no gender difference, there might be differences in the stressors experienced by adolescent boys and girls due to the social environment of the country, and further exploration is necessary. The most influential factor affecting the suicidal ideation of adolescents was the absence of close friends, followed by loneliness and parental drinking. This suggests the necessity of an intervention that fosters peer relationship development, cooperation and emotional support for adolescents. Suicidal ideation of adolescents was also related to the family environment, indicating that the resolution of adolescent mental health problems requires support of not only individuals, but also the family and the community. Although this study was based on small regional convenience samples, limiting the generality of findings, these results provide insight into the requirements of mental health program content and strategies for rural Vietnamese adolescents. In this regard, we suggest further research to develop a school-based mental health program for preventing suicide behaviors of Vietnamese rural adolescents, focusing on improving interpersonal skills in association with family and community.

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