

Factors for Suicidal Ideation in Middle School Students by Gender

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ABSTRACT

Purpose: This study was conducted to identify the factors of suicidal ideation in middle school students by gender, and to announce the necessity of gaining upon a socio-cultural comprehension-based approach. **Methods:** Three middle schools were randomly selected from a pool of 21 middle schools in S City, and were stratified by school and grade. A total of 878 students were included in the analysis. Multiple logistic regression analysis was conducted to identify the factors that affect suicidal ideation by gender. **Results:** Suicidal ideation and depression scores of the female students were over twofold higher than those of the male students. The factor that was found to affect suicidal ideation in the male students was depression while for the female students the factors were visiting suicide-related websites, having friends who attempted to commit suicide, depression, and poor communication with one's parents. **Conclusion:** The findings in this study support gender differences in suicidal ideation, and suggest that building socio-cultural environments are needed to abate their negative emotions and to help youth find out their reasons to live.

Key Words: Suicidal Ideation, Depression, Comprehension, Youth

INTRODUCTION

Suicide has been reported to be the fourth highest cause of death in South Korea since 2005. In terms of age, from the teens to the thirties, suicide has been ranked as the first cause of death in both males and females. It has been the highest (29.1/100,000 persons) and was over twofold higher than the OECD average (12.1/100,000 persons) in a single year [1]. With almost one million people dying from suicide around the world each year, and with a disproportionate impact of such on the world's youth, the global society owes it to the future generations to act now with regard to such matter [2].

Suicidal ideation is distinguished from suicidal attempt and suicide but is linked to them. Although not all cases of suicidal ideation would necessarily lead to suicidal attempt or suicide, suicidal ideation has been geared to-

wards suicide and could facilitate suicidal risk and the plausibility of committing suicide [1,3,4]. The ripple effect - that is, that suicide may impact on the lives and mental health of many families and communities, beyond the individual who commits it - dictates the need for collective action to acknowledge and address the problem as well as for commitment to effective interventions supported by political will and resources [2].

Adolescence is a transitional stage of rapid developmental change in the physical, psychological, intellectual, and social realms, which exposes one to increasing self-consciousness and doubts about one's identity. These rapid changes can induce stressful conditions and may lead to emotional instability and impulsiveness [5-7]. According to the 2013 Korean Youth Health Behavior Survey (9th), the level of stress cognition and depression of adolescents is higher than that of adults and is higher in girls

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than in boys and in high school students than in middle school students [8]. Suicidal ideation was also found to be higher in high school students than in middle school students, but the suicidal attempt rate was found to be higher in middle school students than in high school students [8].

Adolescents who have suicidal ideation may commit suicide in adulthood tenfold more than those who do not have suicidal ideation [7]. Also, suicidal ideation has a different elevation trend by gender, specially, suicidal ideation rate in girls has highly elevated from twelve to fourteen years old as that of boys [9]. Suicide is a concept resulting from suicidal ideation and suicidal attempt [4,10], and suicidal ideation among the youth needs to be given particular attention and public health concern [9].

In previous studies, the factors that affect the adolescent suicidal ideation rate were condensed into depression, stress [4,9-12], hopelessness [2,3,14], low self-esteem [15,16], absence of social support [2,3,5,11,15], bullying [4,18], conflict with one's parents [4,12,16,17], and poor peer relationships [4,16-18].

Besides, unlike in many other countries, the educational and social structures in South Korea have a tendency to foster crooked college admission practices and emphasize earning a degree rather than learning and ability, which has resulted not only in biased education but also in an imbalanced educational culture, particularly examination-oriented education and early childhood education. Hence, adolescents have come to have stressful conditions that could worsen their anxiety and depression [4]. Specially, family environmental stress and academic stress that affect to suicidal ideation in adolescents have been reported in Korean researches [10,17].

Legislation for suicide prevention, including fostering a life-respecting culture, has been enacted in 2011. Concurrently, Korea Suicide Prevention Center has established and implemented various relevant programs. In school, the student health promotion program has come to emphasize mental health, and this trend has expanded generally, but the scope of the program is still limited, and it is focused on preventive and general education, excepting specific strategies. To identify adolescents' mental health status and to connect which can lay down their suicidal ideation, an approach based on socio-cultural comprehension is needed. Although suicidal ideation rate was higher in high school students than in middle school students, this study focused on middle school students considering their conditional differences; elevation of academic stress in general, emotional instability, depression, and decreasing of self-esteem.

This study was conducted to identify the factors for sui-

cidal ideation in middle school students by gender, and to announce the necessity of gaining upon socio-cultural comprehension based approach.

METHODS

1. Study Design

This study used a cross-sectional survey research design, conducting secondary analysis of screening survey data from Siheung Mental Health Center in Gyeonggi Province, South Korea. The screening survey was conducted to examine the youth's mental health status and to gather basic data for use in coming up with a community-based mental health program. The study received ethical approval from the Institutional Review Board of J Oriental Hospital, which is affiliated with S University (SMJ/OH, 2010-4).

2. Setting and Sample

This study was conducted in three middle schools randomly selected from a pool of 21 middle schools in S City. The sample was stratified by school and grade (3 classes per grade, 9 classes in one school). A total of 18 classes were selected, and a total of 906 students from the three schools agreed to participate in the study. During the data screening, the 28 participants who only partially completed the survey questionnaire were dropped out of the study. As such, a total of 878 participants were included in the analysis. Based on the power calculation using the G*Power program, effect size $f^2=0.15$, $\alpha=.05$, power $(1-\beta)=.95$, and Odds 1.5, and considering depression the main variable related to suicidal ideation, as in the previous research [19], 417 participants were needed for the multiple logistic regression model. The actual number of participants in this study was sufficient.

3. Procedure

Data collection was conducted from November 1 to December 10, 2010. Three middle schools were randomly picked from a pool of 21 middle schools in S City. Three classes were randomly assigned in each grade, and nine classes per school. A document reflecting the research purpose and a request for cooperation was sent to the principal of each school, but direct contact was established with the target participants to obtain their informed consent to participate in the study. After the explanation of the research purpose to them, the students signed the informed-consent form. The ethical-consideration infor-

mation that the students' participation was not mandatory and could be withdrawn at any time during the study was given to the students in advance.

4. Measures

1) Suicidal ideation

Suicidal ideation was measured using the Korean Suicidal Ideation Questionnaire (KSIQ), which is a modified version [20] of the Reynolds Suicidal Ideation Questionnaire (RSIQ) developed by Reynolds [21]. The 30 items of the RSIQ elicit data about a person's thoughts about and views of suicidal ideation. Each item is scored based on a 7-point Likert scale ranging from 0 to 6. The means across all the items are summed up to obtain the total score (range: 0~180); a higher score indicates a higher level of suicidal ideation. The reliability was .96 for the males and .98 for the females in this study. The cut-off score for suicidal ideation was 20, reported as having the optimal clinical utility based on the results of a clinical study involving adolescents aged 13~18[22]. In this study, the cut-off score for suicidal ideation was chosen by this clinical utility report.

2) Academic stress

Academic stress was measured using the Visual Analog Scale (VAS), a 10cm horizon bar ranging from 0 (left end) to 10 (right end). Each subject marked his/her own academic stress level on the instrument, and a higher mark represents a higher level of academic stress. Most of the other existing academic stress scales are included in general stress inventories or consist of many items, which might elevate the dropout rate or lessen the reliability of the results obtained. VAS is based on the intensity of the respondent's conformity to each of the items, and can evaluate the evaluation object easily, but its validity is still being debated [23]. Hence, by targeting 119 middle school students, partial correlation analysis was conducted between VAS and Adolescent Academic Stress Scale, which is used for the Korean Adolescent Panel Survey [17], to establish concurrent validity ($r=.736, p<.001$).

3) Depression

Depression was measured using Beck Depression Inventory II (BDI II)[24], which consists of 21 items. Each item is scored based on a 4-point Likert scale ranging from 0 (not at all) to 3 (severely). The means across all the items are summed up to obtain the total score (range: 0~63); a higher score indicates a higher level of depression. The reliability was .90 in this study.

4) Self-esteem

Self-esteem was measured using VAS, which was described earlier. Each subject marked his/her own self-esteem level on the instrument; a higher mark indicates a higher level of self-esteem. Although the validity of VAS is still being debated [23], the instrument is based on the intensity of the respondent's conformity to each of the items, and can evaluate the evaluation object easily. To address VAS's weakness in terms of validity, targeting 119 middle school students, partial correlation analysis was conducted between VAS and Adolescent Self-Esteem Scale, which is used for the Korean Adolescent Panel Survey [17], to establish concurrent validity ($r=.779, p<.001$).

5) Communication with one's parents

To measure the respondent's level of communication with his/her parents, a subscale (8 items related to communication with one's parents) of Inventory of Parent and Peer Attachment (IPPA) developed by Armsden and Greenberg (1987)[25] was used. Each item is scored based on a 4-point Likert scale ranging from 1 (never) to 4 (almost every day). The means across all the items are summed up to obtain the total score (range: 8~32); a higher score indicates frequent communication with one's parents. The reliability was .78 in this study.

5. Data Analysis

Descriptive statistics were used to evaluate the characteristics of the subjects by gender, and the χ^2 test was used to compare the differences in suicidal ideation according to the general characteristics and suicide-related variables of the subjects by gender. The independent t-test was used to compare the subjects' academic stress, depression, self-esteem, and communication with their parents according to suicidal ideation by gender. To identify the factors that affect suicidal ideation by gender, multiple logistic regression analysis was conducted. For data analysis, SPSS/WIN 16.0 was used.

RESULTS

1. Characteristics of the Subjects and Suicidal ideation relating variables

Except for 10.5% of the subjects, the subjects had mid-low school grades (boys: 90.0%; girls: 88.9%). Most of the subjects claimed that their family income was under 2 million Korean won per month. With regard to the subjects' health behavior 39.3% of all the subjects were ad-

dicted to the Internet, and in particular, 8.4% had friends who had attempted to commit suicide while 2.1% had family members who had attempted to do the same. And there were gender differences in suicidal ideation, academic stress, and depression. The subject female students had significantly higher scores in suicidal ideation, academic stress, and depression compared to the subject male students ($p < .001$). Especially, the suicidal ideation in the subject female students was over twofold higher than that in the subject male students (boys: 13.3%; girls: 31.1%)(Table 1).

2. Suicidal Ideation according to the General Characteristics and Suicidal Ideation Relating Variables by Gender

Among the subject male students, there were significant group differences in suicidal ideation according to whether or not they visited suicide-related websites ($p < .001$) and whether or not they had friends who had attempted to commit suicide ($p = .008$). Among the subject female students, there were also significant group differences in suicidal ideation according to whether or not

Table 1. General Characteristics and Suicidal Ideation Related Variables of the Subjects

(N=878)

Variables	Categories	Total (N=878)	Male (n=473)	Female (n=405)	χ^2 or t (p)
		n (%) or M \pm SD	n (%) or M \pm SD	n (%) or M \pm SD	
Grade	7	295 (33.6)	158 (33.4)	137 (33.8)	1.39 (.497)
	8	287 (32.7)	153 (31.3)	145 (34.3)	
	9	296 (33.7)	174 (35.3)	129 (31.9)	
Religion	Have	463 (52.7)	232 (49.0)	231 (57.0)	5.59 (.021)
	None	415 (47.3)	241 (51.0)	174 (43.0)	
Academic performance	Excellent	92 (10.5)	47 (9.9)	45 (11.1)	0.32 (.851)
	Moderate	391 (44.5)	212 (44.8)	179 (44.2)	
	Poor	395 (45.0)	214 (45.2)	181 (44.7)	
Living with parents	Yes	748 (85.2)	397 (83.9)	351 (86.7)	1.29 (.294)
	No	130 (14.8)	76 (16.1)	54 (13.3)	
Family income (10,000 won/month)	< 200	191 (24.9)	83 (19.7)	108 (31.4)	16.33 (< .001)
	200~400	444 (58.0)	254 (60.2)	190 (55.2)	
	> 400	131 (17.1)	85 (20.1)	46 (13.4)	
Smoking	Smoke	158 (18.0)	107 (22.6)	51 (12.6)	14.87 (< .001)
	None	720 (82.0)	366 (77.4)	354 (87.4)	
Alcohol consumption	Drink	105 (12.0)	59 (12.5)	46 (11.4)	0.26 (.677)
	None	773 (88.0)	414 (87.5)	359 (88.6)	
Internet addiction	Yes	345 (39.3)	237 (50.1)	108 (26.7)	50.25 (< .001)
	No	533 (60.7)	236 (49.9)	297 (73.3)	
Visiting suicide-related websites	Yes	28 (3.2)	9 (1.9)	19 (4.7)	5.49 (.021)
	No	850 (96.8)	464 (98.1)	386 (95.3)	
Having friends who have attempted to commit suicide	Yes	74 (8.4)	15 (3.2)	59 (14.6)	36.72 (< .001)
	No	804 (91.6)	458 (96.8)	346 (85.4)	
Having family members who have attempted to commit suicide	Yes	18 (2.1)	8 (1.7)	10 (2.5)	0.66 (.418)
	No	860 (97.9)	465 (98.3)	395 (97.5)	
Suicidal ideation score [†]	≥ 20	189 (21.5)	63 (13.3)	126 (31.1)	40.88 (< .001)
	< 20	689 (78.5)	410 (86.7)	279 (68.9)	
Suicidal ideation	(0~180)	15.59 \pm 27.05	9.44 \pm 18.13	22.78 \pm 33.29	-7.20 (< .001)
Academic stress	(0~10)	6.07 \pm 2.24	5.77 \pm 2.36	6.43 \pm 2.05	-4.41 (< .001)
Depression	(0~63)	10.29 \pm 8.41	8.81 \pm 7.36	12.02 \pm 9.21	-5.66 (< .001)
Self-esteem	(0~10)	6.73 \pm 2.38	6.84 \pm 2.44	6.61 \pm 2.32	1.40 (.162)
Communication with one's parents	(8~32)	21.50 \pm 4.94	21.25 \pm 4.82	21.80 \pm 5.07	-1.67 (.096)

[†] Cut-off score for suicidal ideation: 20.

Table 2. Differences in Suicidal Ideation according to the General Characteristics and Suicidal Ideation Related Variables (N=878)

Variables	Categories	Suicidal ideation [†]					
		Male (n=473)		χ^2 (p)	Female (n=405)		χ^2 (p)
		< 20	≥ 20		< 20	≥ 20	
n (%)	n (%)	n (%)	n (%)				
Grade	7	132 (83.5)	26 (16.5)	2.65 (.266)	87 (63.5)	50 (36.5)	2.98 (.226)
	8	133 (89.9)	15 (10.1)		98 (70.5)	41 (29.5)	
	9	145 (86.8)	22 (13.2)		94 (72.9)	35 (27.1)	
Religion	Yes	196 (84.5)	36 (15.5)	1.91 (.178)	157 (68.0)	74 (32.0)	0.21 (.666)
	No	214 (88.8)	27 (11.2)		122 (70.1)	52 (29.9)	
Academic Performance	Excellent	42 (89.4)	5 (10.6)	0.99 (.609)	32 (71.1)	13 (28.9)	0.36 (.833)
	Moderate	186 (87.7)	26 (12.3)		125 (69.8)	54 (30.2)	
	Poor	182 (85.0)	32 (15.0)		122 (67.4)	59 (32.6)	
Living with parents	Yes	348 (87.7)	49 (12.3)	2.04 (.153)	247 (70.4)	104 (29.6)	2.69 (.115)
	No	62 (81.6)	14 (18.4)		32 (59.3)	22 (40.7)	
Family income (10,000 won/month)	< 2	67 (80.7)	16 (19.3)	3.39 (.184)	70 (64.8)	38 (35.2)	1.10 (.576)
	2~4	223 (87.8)	31 (12.2)		133 (70.0)	57 (30.0)	
	> 4	76 (89.4)	9 (10.6)		33 (71.7)	13 (28.3)	
Smoking	Smoke	92 (86.0)	15 (14.0)	0.59 (.872)	21 (41.2)	30 (58.8)	20.91 ($< .001$)
	None	318 (86.9)	48 (13.1)		258 (72.9)	96 (27.1)	
Alcohol consumption	Drink	51 (86.4)	8 (13.6)	0.03 (1.00)	19 (41.3)	27 (58.7)	18.42 ($< .001$)
	None	359 (86.7)	55 (13.3)		260 (72.4)	99 (27.6)	
Internet addiction	Yes	209 (88.6)	27 (11.4)	1.44 (.279)	58 (53.7)	50 (46.3)	15.85 ($< .001$)
	No	201 (84.8)	36 (15.2)		221 (74.4)	76 (25.6)	
Visiting suicide-related websites	Yes	3 (33.3)	6 (66.7)	22.62 ($< .001$)	1 (5.3)	18 (94.7)	37.65 ($< .001$)
	No	407 (87.7)	57 (12.3)		278 (72.0)	108 (28.0)	
Having friends who have attempted to commit suicide	Yes	9 (60.0)	6 (40.0)	9.55 (.008)	23 (39.0)	36 (61.0)	28.82 ($< .001$)
	No	401 (87.6)	57 (12.4)		256 (74.0)	90 (26.0)	
Having family members who have attempted to commit suicide	Yes	7 (87.5)	1 (12.5)	0.05 (1.00)	4 (40.0)	6 (60.0)	3.99 (.077)
	No	403 (86.7)	62 (13.3)		275 (69.6)	120 (30.4)	

[†] Cut-off score for suicidal ideation: 20.

they were smokers, whether or not they drank alcohol, and whether or not they were addicted to the Internet ($p < .001$). That is, among both the subject male and female students, those who visited suicide-related websites and who had friends who had attempted to commit suicide were found to have significantly higher suicidal-ideation scores than those who did not visit suicide-related websites and did not have friends who had attempted to commit suicide (Table 2).

3. Differences in Academic Stress, Depression, Self-esteem, and Communication with Parents according to Suicidal Ideation by Gender

Based on the cut-off score for suicidal ideation (20), in both the subject male and female students, the academic

stress and depression were significantly higher in the suicidal-ideation group than in the non-suicidal-ideation group while the self-esteem and communication with parents were significantly lower in the suicidal-ideation group than in the non-suicidal-ideation group, whose suicidal-ideation score was under 20 ($p < .001$)(Table 3).

4. Factors affecting Suicidal Ideation by Gender

To identify the factors that affect suicidal ideation in middle school students, multiple logistic analysis was conducted. For independent variables, significant variables both male and female students which were analyzed in descriptive analysis were included. Among suicidal ideation relating variables, visiting suicide related websites and having friends who have attempted suicide

which were examined nominal variables changed to dummy variables.

For the subject male students, the factor that was found to affect suicidal ideation was depression; a 1 point increase in the depression score led to 1.2-fold higher odds of suicidal ideation (95%CI: 1.13~1.26). For the subject female students, those who visited suicide-related websites had 28-fold higher suicidal-ideation scores than those who did not (95%CI: 2.74~285.74), and those who had friends who had attempted to commit suicide got 3.40-fold higher suicidal-ideation scores than those who did not (95% CI: 1.57~7.38). Also, a 1 point increase in the depression score led to 1.165-fold higher odds of suicidal ideation (95% CI: 1.12~1.22), and a 1 point increase in the communication with parents score led to 0.91-fold lower odds of suicidal ideation (95% CI: 0.86~0.97)(Table 4).

DISCUSSION

Social interests for suicide have been increased as the highest suicide mortality rate, and many studies on suicidal ideation have been conducted in Korea. This study was conducted not only to identify the factors for suicidal ideation in middle school students by gender, but also to announce the necessity of gaining upon socio-cultural comprehension based approach which offset suicidal ideation in middle school students.

There were differences in the suicidal-ideation scores by gender according to the general characteristics of the subjects. Jeon and colleagues [18] reported that conflicts and stress with one's peer group and conflicts with one's parents were the common predictable variables related to suicidal ideation. Conflicts with one's parents were ranked

Table 3. Differences in Academic Stress, Depression, Self-esteem, and Communication with Parents according to Suicidal Ideation (N=878)

Variables	Range	Suicidal ideation [†]					
		Male (n=473)		t (p)	Female (n=405)		t (p)
		< 20	≥ 20		< 20	≥ 20	
		M±SD	M±SD		M±SD	M±SD	
Academic stress	0~10	5.60±2.27	6.90±2.61	-4.17 (<.001)	6.03±1.97	7.31±1.95	-6.07 (<.001)
Depression	0~63	7.30±5.83	18.65±8.59	-10.13 (<.001)	8.41±6.38	20.03±9.46	-12.56 (<.001)
Self-esteem	0~10	7.13±2.19	4.91±3.01	5.63 (<.001)	7.11±2.01	5.50±2.58	6.24 (<.001)
Communication with one's parents	8~32	21.72±4.64	18.16±4.87	5.63 (<.001)	23.01±4.44	19.13±5.38	7.09 (<.001)

[†] Cut-off score for suicidal ideation: 20.

Table 4. Factors Influencing Suicidal Ideation by Gender

(N=878)

Variables		Male (n=473)					Female (n=405)				
		β	SE	OR	95% CI	p	β	SE	OR	95% CI	p
Visiting suicide-related websites	(1: yes; 0: no)	1.76	0.95	5.83	0.90~37.77	.064	3.32	1.19	28.00	2.74~285.74	.005
Having friends who have attempted suicide	(1: yes; 0: no)	0.25	0.94	1.29	0.20~8.17	.789	1.23	0.40	3.40	1.57~7.38	.002
Academic stress		0.00	0.08	1.00	0.86~1.17	.981	0.14	0.08	1.15	0.99~1.34	.071
Depression		0.18	0.03	1.19	1.13~1.26	.000	0.15	0.02	1.17	1.12~1.22	.000
Self-esteem		-0.12	0.08	0.89	0.76~1.03	.105	-0.05	0.07	0.95	0.82~1.10	.510
Communication with one's parents		-0.06	0.04	0.94	0.87~1.01	.104	-0.09	0.03	0.91	0.86~0.97	.004
Constant					-2.118					-1.875	
Degree of freedom					1					1	

as the factor with the greatest effect in both the subject male and female students, followed by bullying and familial economic status in the subject male students and by conflicts with one's peer group and familial economic status in the subject female students. Other studies reported that familial economic status could adversely affect adolescent mental health, smoking, and alcohol consumption [11]. Also, Internet suicide site accessibility was added to the factors affecting suicidal ideation, as well as conflicts with familial members or friends [2].

Based on the cut-off score for suicidal ideation (20), the academic stress and depression were higher and the self-esteem and communication with one's parents were lower in the suicidal-ideation group than in the non-suicidal-ideation group. In previous studies, self-esteem [15,16], familial alliance [12,16,18], and social support [2,3,5,15] were found to lessen the danger of suicidal ideation. In this study, self-esteem and communication with one's parents presented a similar effect of abating suicidal ideation. Depression was cited as a critical factor in suicidal ideation psychologically [4,10-13], and life events preceded suicidal ideation [2,4,14,26]. As discussed earlier, the suicidal ideation in the subject female students in this study was twofold higher than in the subject male students, and the smoking and alcohol consumption rates were higher in the suicidal-ideation group than in the non-suicidal-ideation group among the subject female students. It is presumed that smoking and alcohol consumption need to be more carefully observed or monitored in female students than in male students.

Suicide impacts the most vulnerable of the world's populations, and places a larger burden on the low- and middle-income countries [2], and this economic vulnerability could be linked to other poor conditions, not only to the factors impacting suicidal ideation among adolescent [5,11,18]. In this study, the characteristics and environment of the subjects regarded that they were socio-economically disadvantaged: 82.9% of the students lived in a family that their family income were under 4,000,000 won per month (family median income was 4,220,000 won per month in Korea), especially 24.9% were under 2,000,000 won; and Internet-addicted, 39.3%; and low school grades, 45.0%. These socio-economically disadvantaged conditions have resulted in adolescents' depression and suicidal ideation [12].

Also, in suicidal ideation relating variables, gender differences were found in terms of visiting suicide-related websites, having friends who have attempted to commit suicide, academic stress, and depression; more female students visited suicide-related websites and had friends

who have attempted to commit suicide, and the academic stress and depression in the female students were significantly higher than those in the male students. It is not irrelevant that in previous studies, the depression level of the female students was higher than that of the male students [4,12,14], and the female students could be more sensitive in terms of stress [12,26]. Phillips et al., [15] reported that negative emotions strongly associated with current and future self-harm in both male and female adolescents, while self-esteem strongly moderated current and future self-harm. It is suggested that negative emotions and response to neutral life events should be attenuated and should hold gender differentiated approach.

Shim and Kim [19] revealed that the suicidal ideation relating factors differ by phase; in early youth, stress and depression are the most powerful factors, and in mid- and late youth, the social support and impact of one's relationship with a significant key person determined the level of one's suicidal ideation. On the contrary, Kim [27] found that self-efficacy, which has a protective effect on early-youth suicidal ideation, decreases in mid- and late youth while the impact of depression is maintained. Another study presented participation in sports teams in and outside of school protected against suicidal ideation [13]. Considering gender and youth phase, suicidal ideation rate in boys showed indifferences, while the rate in girls showed peak elevation in age twelve to fourteen years old and relieved after age fifteen years old [9]. Although the differences depending on the youth phase and gender have not been verified, it may be appropriate to approach the clients considering the youth phase they are in for the suicidal ideation prevention program's effectiveness.

The multiple logistic regression analysis revealed that in the male students, depression was the sole factor that influenced suicidal ideation, while in the female students, visiting suicide-related websites, having friends who have attempted to commit suicide, depression, and communication with one's parents influenced suicidal ideation. Especially, among the female students, those who visited suicide-related websites showed a 28-fold higher suicidal-ideation risk than those who did not, which is more than quadruple that among the male students. Although Shim and Kim [19] showed that the suicidal ideation relating factors are indifferent by gender, Jeon and colleagues [18] reported that academic performance, family economic state, conflicts with one's parents, bullying, and conflicts with one's friend related with suicidal ideation, and these are prominent in girls than those of boys. And family environmental stress and academic stress that affect to suicidal ideation in adolescents have been reported [10,17]. In

this study, academic stress had related in suicidal ideation but didn't affect to suicidal ideation in logistic analysis both male and female students. Further study is needed to identify various stress inducing variables to confirm suicidal ideation affecting factors.

In Smahel and colleagues' [28] research, digital media including internet use and technology impacted physical and mental health problems to children. It is presumed that female students who have a negative mental state and strong emotional stress due to their personal conditions, including their familial environment, have a great risk to suicidal ideation. Further research should investigate whether internet addiction and visiting suicide-related website are correlated.

In the Guidelines for the Prevention of Suicide, the United Nations cites the following key components of national suicide prevention strategies: clear objectives, relevant risk and protective factors, and effective interventions. Further, the intervention targets should be divided into the general population, the vulnerable subpopulations at risk, and individuals [29]. Also, gatekeeper training, crisis care, scaling up human resources, and access to and management of persons at risk should be considered, as well as restricting access to means of inflicting self-harm and development of policies aimed at reducing the risk [2]. In South Korea, rapid growth and development may induce a work-oriented society and an inordinately education-oriented culture, particularly examination-oriented education and early childhood education. These tight and rigid atmospheres can worsen adolescents' stress; especially, they can aggravate adolescents' depression and provoke negative thinking [4,11]. Also, negative emotions and low self-esteem strongly associated with current and future self-harm in adolescents [15].

Not a few adolescents have faced the danger of suicide; in fact, the leading cause of death among teens at present is suicide in Korea, and the level of stress cognition and depression of adolescents is higher than that of adults [8]. To combat suicide and to prevent suicidal ideation in middle school students, we have to try to take socio-cultural comprehension based approach, and to build an environment which can abate negative emotion and draw out reason for living including making meaningful relations.

Limitations

The limitations of this study should be presented before planning the later study. First, this study was based on the respondents' self-report in response to each item. And academic stress and self-esteem were assessed through

VAS instead of based on a scale with documented reliability, although concurrent validity was applied to address VAS's weakness in validity. If researchers considered another approach in depth, such as focus group interview, we could find more diverse and copious factors which affect to negative conditions of adolescents and intimate conditions that draw in their suicidal ideation. Further research should be conducted to bring more reliable result and evidence to this concern.

CONCLUSION

Most research on suicidal ideation of adolescents in Korea has focused on analyzing risk factors, and the factors contributing to suicidal ideation by gender have reported inconsistently in each study. This study was conducted to identify the factors for suicidal ideation in middle school students by gender, and to suggest the needs for socio-cultural comprehension based approach which put down their suicidal ideation. Suicidal ideation scores of the female students were over twofold higher than those of the male students. The factor that was found to affect suicidal ideation in the male students was depression while for the female students the factors were visiting suicide-related websites, having friends who attempted to commit suicide, depression, and poor communication with one's parents.

Definitely, we should take responsibility in combating suicide by building a socio-cultural environment as well as preventing and managing the suicide risk of adolescents: diminution of negative emotion, making school culture which generate encouraging and consolation, and drawing out the reason for living. It would be possible when family, school, community including policymakers strives to develop diverse socio-cultural environment.

Conflict of Interest

The authors declared no conflict of interest.

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