Association between Social Anxiety Symptoms and Suicidal Risk in College Students

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Background: Social anxiety and suicide are serious common problems in college students. However, there are few studies on the relationship between social anxiety symptoms and suicidal risk. Therefore, we evaluated the association between social anxiety symptoms and suicidal risk in college students.

Methods: A total of 579 college students were recruited for a college-based cross-sectional survey in the Jeju area. The participants completed a questionnaire gathering sociodemographic information; they also completed the Korean Social Avoidance and Distress Scale (SADS) to assess social anxiety symptoms and the Center for Epidemiologic Studies Depression Scale (CES-D) to assess depressive symptoms. To obtain information regarding suicidal risk, we administered the Korean version of the Suicide module of the Mini International Neuropsychiatric Interview (M.I.N.I.).

Results: The prevalence of higher levels of social anxiety symptoms among college students was 28.0% (n=162). A higher level of social anxiety symptoms resulted in a 2.10-times higher suicidal risk after adjusting for depression in college students (95% confidence interval, 1.05–4.23; p=0.037).

Conclusion: Based on the results of this study, social anxiety symptoms should be managed and controlled to prevent suicidality in Korean college students.

Keywords Social anxiety symptoms; Suicidal risk; Depression; College students

INTRODUCTION

Social anxiety disorder is a serious mental illness with high prevalence, which can lead to a significant loss of psychosocial function. The lifetime prevalence of social anxiety disorder was approximately 13% in the United States in 2012, which was the second largest number among anxiety disorders in the United States [1] and that in Korea in 2016 was 1.6%, which means it was the third most common anxiety disorder in Korea [2]. Social anxiety disorder is characterized by prominent and persistent fear of social situations, such as being exposed to strangers or closely observed by other persons [3,4]. People with social anxiety symptoms are anxious about most social situations and try to avoid them, which may

eventually lead to severe disability in many areas of life [5,6].

Suicide is a serious problem for young adults, such as college students. In 2017, the rate of suicide per 100,000 people in the ages of 20–29 years in South Korea was 16.4. It was 44.8% of the cause of death in people in their 20s. This shows that suicide is the most common cause of death for people in their 20s [7]. About 90% of those who died from suicide had psychiatric illnesses such as depression, anxiety disorders and substance use disorders [8]. This high association between suicide and psychiatric illness suggests that assessment and treatment of psychiatric illness is essential for college students showing suicide-related behaviors.

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About 11.9% of college students have symptoms that fall within the category of anxiety disorder—including social anxiety disorder—which has the highest prevalence among psychiatric illnesses studied in the research targeting college students [9]. Early adulthood is an important stage of psychosocial adaptation, such as identity formation, self-directed performance, expansion of personal relationships, etc. Social anxiety symptoms of college students in this period may narrow their social network and cut opportunities for social performance, resulting in serious degradation of function and lowered quality of life [10]. Social anxiety symptoms of college students may also lead to stress and failure in social adaptation [10], and may even causes or aggravate serious psychopathology, such as depression and suicide behaviors [11]. However, few studies have been conducted on the relationship between social anxiety symptoms and suicidal risk among college students. Given these, this study was performed to verify the relationship between various sociodemographic variables, social avoidance and anxiety symptoms, and suicide behaviors of college students. By doing this, the study intends to arrange a systematic intervention mechanism to manage mental health of college students to prevent them from committing suicide.

MATERIALS AND METHODS

1. Subjects

In this study, the researchers sent letters, including a statement explaining the purpose of the study, to colleges in the Jeju area. Two colleges agreed with the purpose of the study, and the researchers received written informed consent from 605 college students, who completed a self-administered questionnaire. Finally, 579 college students (95.7%) were recruited for a college-based cross-sectional survey in the Jeju area. The total sample of 579 students included 285 males (49.2%) and 294 females (50.8%). The mean±standard deviation age was 21.3±1.5 years (males: 21.8±1.6 years, females: 20.7±1.0 years). This study was approved by the Institutional Review Board of Jeju National University Hospital in Korea (IRB No. JNUH 2018-10-009).

2. Assessment

Social anxiety symptoms was evaluated using the Korean version of the Social Avoidance Distress Scale (SADS), which is based on the SADS developed by Watson and Friend [12]; it was tested for reliability in Korean university students by Lee and Choi [13]. The SADS is a 28-item self-report instrument. The total score ranges from 28 to 140, and higher scores indicate higher levels of social anxiety. The total score was used to determine and classify levels of social anxiety as none (<63 points), mild (64-81 points), moderate (82-98 points), or severe (>99 points). In the present study, those in the moderate and severe social anxiety symptom groups were considered to present higher levels of social anxiety [13].

Depressive symptoms were evaluated by the Korean version of the Center for Epidemiologic Studies Depression Scale (CES-D), which is based on the CES-D developed by Roberts et al. [14]; it was tested for validity in Korea by Cho and Kim [15]. The CES-D is a 20-item self-report instrument. The total score ranges from 0 to 60, and higher scores indicate higher levels of depression. The optimal cut-off score identified in the validation study of the Korean version of the CES-D was 21 [15].

Suicidal risk was evaluated by the Korean version of the suicide module of the Mini International Neuropsychiatric Interview (M.I.N.I.), which is based on the suicide module of the M.I.N.I. developed by Sheehan et al. [16]; it was tested for validity in Korea by Yoo et al. [17]. The suicide module of the M.I.N.I. is a 6-item self-report instrument. The score for each answer was weighted according to its importance in assessing suicidal risk, and the total score was used to determine and classify current suicidal risk as low (1-5 points), moderate (6-9 points), or high (>9 points) [17]. In the present study, those in the moderate and high risk groups were considered to present higher suicidal risk.

This study used a self-administered questionnaire to gather data on subjects' sociodemographic characteristics. The study participants completed a questionnaire regarding age, sex, family relationship, religion, history of a psychiatric disorder, history of medical illness, and socioeconomic status (SES), which was classified by family income as '<2 million won per month,' '2-4 million won per month,' or '>4 million won per month.'

3. Statistical analysis

We classified participants into four groups by the level of social anxiety and then compared the four groups according to clinical factors, including sociodemographic characteristics, depressive symptoms, and suicidal risk. Our analyses used the chi-square test for categorical variables and one-way analysis of variance for continuous variables. Scheffe's post hoc test was used to detect differences. Univariate associations between independent variables and higher levels of social anxiety were investigated. Factors potentially associated with a higher level of social anxiety in univariate analyses were entered simultaneously into a multivariate logistic regression model to assess their independence. Two-tailed *p*-values of 0.05 were considered significant. All statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 20.0 (IBM Co., Armonk, NY, USA).

RESULTS

According to the level of social anxiety symptoms, 579 students were classified into four groups; 169 students (29.0%) were in the 'none' group, 249 students (43.0%) were in the 'mild' group, 135 students (23.3%) were in the 'moderate' group, and 27 students (4.7%)

were in the 'severe social anxiety symptoms' group. Thus, 162 (28.0%) were in the 'higher level (moderate or severe) of social anxiety symptoms' group. Table 1 summarizes characteristics of the subjects by social anxiety symptom groups. A significant sex difference in group assignment was observed ($F=15.65$, $p=0.001$); females comprised 42.9% of participants in the 'none' group, 49.0% of those in the 'mild' group, 58.5% of those in the 'moderate' group, and 77.8% of those in the 'severe social anxiety symptoms' group. No significant differences were found among the four groups in age, family relationship, religion, history of psychiatric disorder, history of medical illness, or SES.

Significant group differences were observed in CES-D total scores ($p<0.001$; Table 1), with mean CES-D scores of 9.5 ± 8.4 in the 'none' group, 12.7 ± 9.1 in the 'mild' group, 16.5 ± 10.4 in the 'moderate' group, and 22.7 ± 13.4 in the 'severe social anxiety symptoms' group. Significant group differences were also observed in CES-D positivity (defined as total score ≥ 21 ; $p<0.001$; Table 1). CES-D positivity was 13.1% in the 'none' group, 19.3% in the 'mild' group, 34.1% in the 'moderate' group, and 51.9% in the 'severe social anxiety symptoms' group.

Significant group differences were observed in the prevalence rate for suicidal ideation within the past month ($p<0.001$; Table 2), which was 11.9% in the 'none' group, 19.3% in the 'mild' group, 27.4% in the 'moderate'

Table 1. Characteristics of subjects by social anxiety symptoms

Variable	Social anxiety symptoms (n=579)				χ^2 or F	p-value
	None (n=168) ^a	Mild (n=249) ^b	Moderate (n=135) ^c	Severe (n=27) ^d		
Age (y)	21.3 $\pm$ 1.5	21.2 $\pm$ 1.4	21.2 $\pm$ 1.6	21.0 $\pm$ 1.3	0.24	0.871
Sex (female)	42.9	49.0	58.5	77.8	15.65	0.001*
Family income (1,000 won/mo)					9.89	0.129
<2,000	23.2	20.5	25.9	11.1		
2,000 $\leq$ and <4,000	52.4	59.4	45.9	70.4		
$\geq$ 4,000	24.4	25.6	28.1	18.5		
Having a religion	32.1	36.1	34.8	29.6	0.99	0.802
History of psychiatric disorder	0.6	1.6	1.5	7.4	7.06	0.070
History of medical illness	6.5	10.8	8.9	3.7	3.23	0.358
Depression						
Total CES-D score	9.5 $\pm$ 8.4	12.7 $\pm$ 9.1	16.5 $\pm$ 10.4	22.7 $\pm$ 13.4	23.47	<0.001*, a<b<c<d
CES-D positivity	13.1	19.3	34.1	51.9	33.77	<0.001*

Value are presented as mean $\pm$ standard deviation or %. The chi-square test and one-way analysis of variance with post hoc test were performed to examine the difference in demographic and clinical characteristics according to social anxiety symptoms.

CES-D, the Center for Epidemiologic Studies Depression Scale.

*Statistically significant difference.

Table 2. Comparisons and M.I.N.I. suicidal risk items by social anxiety symptoms

	Social anxiety symptoms				χ^2 or F	p-value
	None (n=168) ^a	Mild (n=249) ^b	Moderate (n=135) ^c	Severe (n=27) ^d		
Suicidal ideation, past month	11.9	19.3	27.4	51.9	28.03	<0.001*
Suicidal attempt, lifetime	1.8	2.4	3.7	11.1	7.63	0.054
M.I.N.I. suicidal risk scores	0.8±2.9	1.3±3.6	2.0±4.7	3.4±3.9	5.30	0.001*, a<d

Value are presented as % or mean±standard deviation. The chi-square test and one-way analysis of variance with post hoc test were performed to examine the difference in suicidal risk according to social anxiety symptoms.

M.I.N.I., Mini International Neuropsychiatric Interview.

*Statistically significant difference.

Table 3. Factors with social anxiety symptoms: multivariate analysis

Variable	Controls vs. Subjects with social anxiety symptoms		
	OR	95% CI	p-value
Female	1.34	0.92–1.95	0.123
CES-D positivity	1.82	1.07–3.09	0.026*
Higher suicidal risk group	2.10	1.05–4.23	0.037*

OR, odds ratio; CI, confidence interval; CES-D, the Center for Epidemiologic Studies Depression Scale.

*Statistically significant difference.

Fig. 1. Comparisons of higher suicidal risk group by social anxiety symptoms.

group, and 51.9% in the 'severe social anxiety symptoms' group. Significant group differences were also observed on the M.I.N.I. suicidal risk score ($p=0.001$; Table 2), with scores of 0.8 ± 2.9 in the 'none' group, 1.3 ± 3.6 in the 'mild' group, 2.0 ± 4.7 in the 'moderate' group, and 3.4 ± 3.9 in the 'severe social anxiety symptoms' group. Finally, significant group differences were observed in the presence of higher suicidal risk ($p<0.001$; Fig. 1); the percentage of those with higher suicidal risk was 6.5%

in the 'none' group, 14.1% in the 'mild' group, 17.8% in the 'moderate' group, and 37.0% in the 'severe social anxiety symptoms' group.

The multivariate associations between the independent factors and social anxiety symptoms are shown in Table 3. A higher level of social anxiety symptoms was significantly associated with CES-D positivity (odds ratio [OR], 1.82; 95% confidence interval [CI], 1.07–3.09; $p=0.026$) and higher suicidal risk (OR, 2.10; CI, 1.05–4.23; $p=0.037$).

DISCUSSION

In the study, it was found that 23.3% of college students had moderate social anxiety symptoms while 4.7% had severe symptoms. Comparatively few data on the prevalence of ADHD symptoms among college students is available. In a recent multi-national multi-institutional study which surveyed the annual prevalence of each mental illness, targeting adults of 18 to 22 years old including college students, it was found that the annual prevalence of phobia, including agoraphobia without medical history of panic disorder, a specific phobia, and social phobia was 9.0% for college students and 9.9%

for adults of 18-22 year old [18]. The lifetime prevalence of social anxiety disorder drastically varies according to countries, as it was 7% to 13% in the western countries while it is 0.1% to 1.0% in Korea and other Asian countries. This is because the diagnostic threshold is higher and the perception of symptoms is lower in Asia compared to the western countries [19]. Especially, the prevalence of social anxiety disorder in Korea may be underestimated. According to the 2016 mental illnesses survey conducted in Korea, the annual prevalence of social anxiety disorder was 1.0% in the 18 to 29 year-old group and 0.1% to 0.5% in the 30-year-old or older group. The prevalence of social anxiety symptoms in our sample was higher than the range previously reported. However, our results cannot be compared directly to those of previous studies because of differences in the instruments and diagnostic criteria used to assess social anxiety symptoms.

The results of this study show that in the group of college students, females experienced higher levels of social anxiety symptoms than males. It has been reported that females have higher prevalence of social anxiety disorder, with the male to female to ratio of 2:3 [19,20]. In 2016, the prevalence of social anxiety disorder in Korea was 0.5% for females and 0.4% for males. The result where females showed higher prevalence is similar to this study [2]. Yonkers et al. [21] observed patients with social anxiety disorders and found that females more commonly had comorbid anxiety disorders and had more severe functional impairment than males. These sex differences are mainly influenced by learning patterns, gender roles, hormonal effects, susceptibility to stress, and differences in childhood experiences. In addition, the diversity of symptoms according to sex has a potential to affect estimation of the prevalence [22].

In this study, the group with a high level of social anxiety symptoms more responded that there were suicide behaviors for the last month, and showed higher suicidal risk. Suicidal risk factors include despair, lack of social support, psychiatric illnesses, such as anxiety disorders, mood disorders and substance use disorders, and previous suicide attempts [23]. Previous studies found that 22% of patients with social anxiety disorder experienced suicidal ideation for the last month, 35% experienced suicide ideation throughout their lives [24-26], and 12% to 15% of patients attempt suicide during their lifetime [26,27]. The suicide attempt rate of patients with social anxiety disorder in the US was three times higher than

the general people [28].

This study found that social anxiety symptoms are significantly associated with depressive symptoms. Social anxiety disorder is the most common comorbid anxiety disorder among depressive patients [29,30], and comorbid social anxiety disorder diagnoses were present in 15% to 27% of patients with major depression [29-31]. The comorbidity rate of major depression in social anxiety disorder is approximately 30% to 70% [30-34]. Some studies have reported that social anxiety disorder is a significant risk factor that may cause depression in all age groups [31,33,35,36]. In a large-scale prospective study conducted by Beesdo et al. [35], the risk of future depression in patients with social anxiety disorder was twice as high as that of those without social anxiety disorder, and was nearly three times higher than that of those without any anxiety disorders.

It is difficult to clarify the causal relationship between high suicidal risk and depressive symptoms, which were highly associated with high social anxiety level of college students. One possibility according to the interpersonal theory of suicide is that people with social anxiety symptoms feel extreme shame and thus may have a high risk of suicide in an interpersonal aspect [11]. Melancholy is also related with greater thwarted belongingness and perceived burdensomeness, which are two factors which increases risk of suicide in an interpersonal aspect [37]. In consideration of high comorbidity of depression and social anxiety disorders [36], it seems that melancholy may affect relations among suicidal risk factors regarding interpersonal relationship and social anxiety [38].

This study has the following limitations. First, this study was conducted to college students in a specific area (Jeju-si), so it is difficult to generalize the research results. Second, measures of social anxiety symptoms, suicidal behaviors and depression were based on the self-report rather than clinical evaluation. Third, as mentioned above, it is difficult to make any judgment on the causal relationship between the degree of social anxiety symptoms and related factors, due to the limitations that this study has as a cross-sectional study. Lastly, another limitation of this study is that it failed to control other factors related with social anxiety symptoms and suicidal risk, such as psychosocial stress, family environmental factors, and health-related factors. It is needed to conduct well-designed prospective studies with more variables by controlling and multiple-comparing them.

Despite these limitations, this study has significance in that it is a study involving a large number of subjects in the local community. To our knowledge, this is the first study in Korea which investigated the relationship between social anxiety symptoms, depressive symptoms and suicide behaviors among college students.

CONCLUSION

In this study, 28.0% of college students were found to have high level of social anxiety symptoms, which was significantly associated with a higher suicidal risk. Based on these results, it may be necessary to manage and control social anxiety symptoms to prevent suicidality in Korean college students. It is important to help college students with high social anxiety symptoms in an early stage [39]. Increased awareness among parents, educators, and public health officials and a comprehensive approach to monitoring college students' mental health including their social anxiety degree are needed.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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