

Correlates of Depressive Symptoms among College Students on Jeju Island in Korea

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I. Introduction

Depressive disorder is one of the most common psychiatric disorders and is considered a major public health problem in the United States and in some European countries (Weissman et al., 1981; Reiger et al., 1988). Point prevalence of depression in the United States is 18%(Myers and Weissman, 1980), and lifetime prevalence of depression is estimated at 25%(Weissman and Myers, 1978). In Korea, the prevalence of depressive symptoms in men and women has been

estimated at 23.1 and 27.4%, respectively, and the prevalence of depression in men and women at 6.8 and 10.4%, respectively(Cho et al., 1998).

Recently, the suicide rate has been skyrocketing, and the higher proportion of suicides in younger age groups has become a serious social and public health concern (Korea National Statistic Office, 2001). Suicide is generally thought to be a consequence of depression(Sadock and Sadock, 2000). In the Korean cultural milieu, where there is a particular emphasis on good school and college grades, parents' strong desire to

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educate their children rigorously limits the children's experience of developmental norms such as peer relationships, relaxation, etc. Consequently, it is not unreasonable to infer that college students are having problems with social adaptation and quality of life issues. It is difficult for them to gain admission to the college of their choice, and, even if they do, they typically experience high levels of stress. In addition to managing their academic performance, they must also cope with romantic relationships(Park et al., 1985) and the discontent with personal appearance that is currently dominant in Korea(Kang, 2000). Many students are therefore frustrated when they begin to recognize that their success depends only on their ability. Depression is characterized by a negative view of self, reality, and the future(Beck, 1967). It has the capacity to complicate college life, potentially having a negative impact on the futures of students so affected. Thus, finding and treating depression in the early stages is critical to improving students quality of life and reducing their suicide risk.

Recently, effective and economical therapeutic strategies for depression have been developed, and a great deal of attention has focused on early diagnosis and exact measurement of depression. A number of internationally recognized measures have been developed for depression, including the Schedule for Affective Disorders and Schi-

zophrenia(SADS)(Endicott and Spitzer, 1978), the Hamilton Rating Scale for Depression (HRSD)(Hamilton, 1960), the Self Rating Depression Scale(SDS)(Zung, 1965), the Center for Epidemiologic Studies Depression Scale(CES-D) (Randolf, 1977), and the Beck Depression Inventory(BDI)(Beck et al., 1961). Among them, BDI is one of the most commonly used globally. This procedure can be completed by means of simple directions and minimizes the respondent's confusion concerning quantification of their emotional status, since it involves responding to pre-stated questions rather than requiring responses according to a Likert-type scale, which requires self-rating of severity(Rhee et al.^a, 1995). Reliability, validity, and factor analysis of BDI(Rhee et al.^a, 1995; Rhee et al.^b, 1995) and diagnostic validity between CES-D and BDI have been demonstrated (Hahn et al., 1986).

There were many well known risk factors such as female sex(Howarth and Weissman, 1995; Weissman and Klerman, 1977; Weissman and Klerman, 1985), poor life satisfaction (Lee et al., 1986), poor body image satisfaction(Thompson, 1990), Low socioeconomic status(Buglass, 1976; Craig and Van Natta, 1979; Husaini et al, 1980), old age(Hahn et al., 1986; Cho et al., 1998), conflict with boyfriend(Park et al, 1985), poor perceived health status(Mossey and Shapiro, 1982; Doh et al, 1996), poor health habit

(Kawakami et al., 1987; Chung et al., 1997; Sung et al., 1999).

Although depression constitutes a serious public health and college health problem, there have been few investigations of depression among college students in Korea. Therefore, the aim of the present study was to determine the prevalence of depression and depressive symptoms, and their correlates, and to propose countermeasures for depression risk factors among college students.

II. METHODS

1. Sampling

One university and three colleges in Jeju-do were selected as the study population; a total of 945 subjects were selected by multiphasic cluster sampling to represent each department, and each year, in each college. Of the total, 421 were male and 524 were female.

2. Period and interview method

The period of study was one month, March 2003. A self-reporting questionnaire was given to subject students and responses were collected from them.

3. Measuring instrument

We designed a questionnaire for this study to collect sociodemographic information.

Data reported on the questionnaire included age, sex, year in college, the existence of romantic relationships, self-assessed living standard, college marks (grade point averages), college system (4-year or 2-year), etc. Additional questions concerning health behavior addressed perceived health status, life satisfaction, whether breakfast was consumed, body image, body image satisfaction, Alcohol Use Disorder Identification Test (AUDIT), and history and frequency of consumption of alcohol and tobacco. To estimate the prevalence of depressive symptoms, we used the BDI STEN score (Rhee et al.^a, 1995).

4. Statistical Analysis

We presented the prevalence of depressive symptoms as independent variables, and analyzed the differences between each level of the independent variables using the Chi-square test. Then we performed multiple logistic regression analysis, using those independent variables that were found to be statistically significant by the Chi-square test, and the prevalence of depressive symptoms as a dependent variable. Odds ratios (OR) and 95% confidence intervals (95% CI) are presented according to the level of the independent variable. SPSS (version 10.0) software was used in all analyses, with the level of significance defined as $p < 0.05$.

Table 1. Prevalence of depressive symptoms according to sociodemographic characteristics

	Men		Women		Total	
	N	%	N	%	N	%
College system						
p-value [*]		NS		<0.05		<0.05
4-year	42	14.3	30	13.5	89	17.2
2-year	17	14.7	63	21.2	109	26.4
Age [*]						
p-value		<0.05		<0.05		<0.001
18-19	21	20.4	55	22.7	101	29.3
20-22	20	16.7	31	15.0	66	20.2
23-	17	9.6	6	9.2	28	11.5
Cohabit with family						
p-value		NS		NS		NS
Yes	36	15.2	60	17.1	130	22.1
No	23	13.8	30	18.8	64	19.6
Boy or girl friends						
p-value		NS		NS		P=0.059
Never	22	13.6	39	16.7	61	15.4
No	23	20.2	21	24.4	44	22.0
Yes	14	10.7	33	17.1	47	14.5
Self-assessed living standard						
p-value		<0.01		NS		<0.01
High	6	15.8	6	22.2	12	18.5
Middle	32	10.8	70	16.8	138	19.4
Low	17	29.3	15	24.2	42	35.0

* Kai-square test

† Not significant

III. RESULTS

1. Sociodemographic characteristics

Of 1000 subjects who were provided with questionnaires, 945 subjects responded, consisting of 421 (44.6%) men and 524 (55.4%) women. University students made up 56.3% of the sample and college students the remaining 43.7%. The majority (84.5%) of

the subjects came from Jeju, with 15.5% coming from other areas.

2. Prevalence of depressive symptoms

1) Sociodemographic characteristics

Among men, the prevalence of depressive symptoms varied significantly according to age, year in college, and self-assessed living standard. Among women, the prevalence of depressive symptoms differed significantly

Table 2. Prevalence of depressive symptoms according to living habits.

	Total		Men		Women	
	N	%	N	%	N	%
Perceived health status						
p-value*		<0.001		<0.01		<0.001
good	30	9.3	14	8.4	16	10.1
fair	70	17.3	24	15.9	46	18.2
poor	52	25.9	21	22.6	31	28.7
Life satisfaction						
p-value		<0.001		<0.01		<0.001
High	29	8.3	15	8.8	14	7.8
Middle	68	16.8	25	15.3	43	17.8
Low	55	31.4	19	24.7	36	36.7
Breakfast						
p-value		<0.01		NS†		<0.01
irregular	99	19.3	36	16.3	63	21.6
regular	52	12.6	22	11.9	30	13.2
Body image satisfaction						
p-value		<0.001		<0.001		<0.001
High	10	6.8	5	5.6	5	8.8
Middle	61	12.1	26	11.5	35	12.6
Low	80	29.1	28	30.4	52	28.4
AUDIT						
p-value		<0.05		<0.05		NS
Normal	95	14.9	24	10.7	71	17.2
Problem drinker	12	14.0	7	14.3	5	13.5
Alcohol use disorder	38	21.3	22	19.1	16	25.4
Alcohol dependence	7	28.0	6	30.0	1	20.0
Current drinker						
p-value		NS		NS		NS
No	17	14.0	4	10.0	13	16.0
Yes	135	16.7	55	14.9	80	18.3
Smoking						
p-value		NS		NS		<0.001
Never	92	15.5	20	14.0	72	16.0
Past history +	18	16.8	10	14.7	8	20.5
Current smoker	41	18.6	29	14.9	12	48.0
Dieting						
p-value		0.055		NS		NS
To lose	76	19.5	15	15.6	61	20.8
To gain	21	16.2	18	16.4	3	15.0
Never	54	13.2	25	12.3	29	14.1

* Kai-square test

† Not significant

Table 3. Multiple logistic regression analysis of selected variables among both sexes

	Coefficient	S.E.*	Odds Ratio	95% CI†
Intercept	-2.345	0.505	0.096	
Sex	-0.054	0.231	0.948	0.602 - 1.492
College system	0.233	0.209	1.262	0.837 - 1.902
Age				
18-19				
20-22	-0.198	0.225	0.821	0.528 - 1.275
23-	-0.823	0.293	0.439	0.247 - 0.779
Perceived health status				
Good				
Fair	0.452	0.259	1.571	0.946 - 2.610
Poor	0.708	0.286	2.029	1.157 - 3.557
AUDIT				
Normal				
Problem drinker	0.021	0.353	1.021	0.512 - 2.039
Alcohol use disorder	0.350	0.241	1.420	0.886 - 2.275
Alcohol dependence	0.489	0.560	1.631	0.544 - 4.885
Body image satisfaction				
High				
Middle	0.294	0.374	1.342	0.644 - 2.794
Low	1.046	0.384	2.847	1.341 - 6.045
Life satisfaction				
High				
Middle	0.333	0.265	1.396	0.830 - 2.347
Low	0.963	0.290	2.620	1.483 - 4.629
Self-assessed living standard				
High				
Middle	-0.678	0.369	0.507	0.246 - 1.046
Low	-0.143	0.422	0.867	0.379 - 1.981

* Standard Error

† Confidence interval

depending on college system and age.

When the data for men and women were analyzed together, the prevalence of depressive symptoms differed significantly according to college system, age, and self-assessed living standard (Table 1).

3) Living habits

Among men, the prevalence of depressive symptoms varied significantly depending on body image satisfaction, perceived health status, life satisfaction, and AUDIT score. Among women, the prevalence of depressive symptoms differed significantly depending on

perceived health status, body image satisfaction, life satisfaction, consumption of tobacco, breakfast intake, AUDIT score, consumption of alcohol, and dieting behavior.

The overall prevalence of depressive symptoms varied significantly depending on perceived health status, body image satisfaction, life satisfaction, breakfast intake, and AUDIT score, when the data for men and women were analyzed together.(Table 2).

3. Multiple logistic regression

Table 3 shows the results of the multiple logistic regression. Those ranked as having low life satisfaction were significantly more likely to have depressive symptoms than those with high life satisfaction (OR = 2.62; 95% CI, 1.483-4.629). Students over 23 years old were significantly less likely to have depressive symptoms than those under 18 (OR = 0.439; 95% CI, 0.247-0.779). Individuals with low body image satisfaction were significantly more likely to have depressive symptoms than those with high body image satisfaction (OR = 2.847; 95% CI, 1.341-6.045). Those with poor perceived health status were significantly more likely to have depressive symptoms than those with good perceived health status (OR = 2.029; 95% CI, 1.157-3.557).

IV. DISCUSSION

The present study investigated the prevalence of depressive symptoms and their correlates among college students on Jeju Island using the Korean BDI. According to Rhee et al.a(1995), the reliability coefficients of the Korean BDI among men and women are 0.86 and 0.84, respectively. The reliability coefficient in this study was 0.8662. Rhee et al.a(1995) suggested that the cut-off point be set as the score that is one standard deviation away from the mean of the T-score distribution. Using this approach, the T-score cut-off point in the present study was 65 for men and 64 for women; the cut-off point for the raw BDI score was 23 for men and 24 for women. We use the latter cut-off point to demarcate depression in this study. To determine the prevalence of depressive symptoms, we used the BDI STEN scores, which have been used to measure the severity of depression. A STEN score of 7 represents 'a group having depressive traits that could not be diagnosed as clinical depression,' 8 represents 'depression,' 9 and 10 represent 'severe depression.' For the purposes of this study, which were to focus on early diagnosis and treatment of depression, and to propose preventive measures, we defined scores of 7 and over as indicating the presence of depressive symptoms.

The prevalence of depressive symptoms among men and women was 14.4 and 26.8%, respectively, which represents a significant difference. These results are consistent with the results of previous reports (Horwath and Weissman, 1995; Weissman and Klerman, 1977; Weissman and Klerman, 1985). Those studies (Horwath and Weissman, 1995; Weissman and Klerman, 1977; Weissman and Klerman, 1985) that assert the existence of a higher prevalence of depression among women list the sociocultural and biological vulnerability of women as major causes. Another possibility is that the higher prevalence of depression among women in the general Korean population, relative to men, may also be due to their greater longevity (Blazer, 1986).

In both sexes, students in the first year of college had a higher prevalence of depressive symptoms. This may be due to frustration resulting from failure to get into the university of their choice, given that such universities would normally be located on the Korean mainland.

With regard to socioeconomic variables, among men, the prevalence of depressive symptoms varied significantly according to age, year in college, and self-assessed living standard. In women, the prevalence of depressive symptoms differed significantly depending on college systems and age. These findings indicate that, for men, economic

status was more closely related to depression. This result is consistent with reports (Buglass, 1976; Craig and Van Natta, 1979; Husaini et al., 1980) for the general population, which have indicated that people living in poverty are more vulnerable to depression and experience more physical illness and social alienation than do people in better economic circumstances. Examining both sexes together, low socioeconomic status, low college marks, discord in a romantic relationship, and younger age were significant risk factors for depression. This suggests that students have many sources of conflict and stress, and thus are at risk for eventual depression because they are in a phase between adolescence and adult life. This phase in a young adult's life is characterized by adaptation to college, lack of confidence with other students, pressure to perform in college, and often discord with a boy- or girlfriend (Park et al., 1985).

With respect to health perception, health behavior and living habits, in both sexes, poor perceived health status, low self-assessed living standard, and low body image satisfaction were related to depression, which is in agreement with previous results (Mossey and Shapiro, 1982; Doh et al., 1996; Kang, 2000). Smoking and drinking also correlated with depressive symptoms, especially among women. This is consistent with previous research (Kawakami, 1987) indicating that good health behavior correlated with a low

prevalence of depression. However, it is well known that alcohol and tobacco consumption are high on Jeju Island (Ministry of Health and Welfare, 2002). Thus, this result may simply reflect the high overall rate of drinking and smoking there. The prevalence of depressive symptoms showed a significant association to AUDIT scores, which corresponds with Chung et al.'s (1997), and Sung et al. (1999)'s opinion that alcohol dependence, rather than simple maladaptive drinking habits, is highly correlated with depressive symptoms. We found tight associations between depressive symptoms or depression and health perception, health behavior, and living habits, even though no etiological relationships can be established from this study. Students need to resolve stress resulting from peer pressure and social relationships, but the topological location of Jeju Island restricts their ability to resolve such stresses; in fact, rather than turning to constructive measures to relieve stress, students have easy access to alcohol and cigarettes. The dominant importance of appearance in contemporary Korean society is thought to be a factor that could be related to depression and low body image satisfaction.

Body image satisfaction, life satisfaction, and perceived health status were significant in the multiple logistic regression. The highest risk was observed among individuals with low body image satisfaction, followed by

those with low life satisfaction, and finally those with poor perceived health status, in descending order. With increasing age, the odds ratio decreased, indicating that age can be a protective factor for depressive symptoms. Cho et al. (1998) reported that people with low levels of self-assessed living standards were at high risk for depression, in an adult sample population. In the present study, self-assessed living standard was not statistically significant, suggesting that the college students were not directly influenced by socioeconomic status; however the high correlation between life satisfaction and self-assessed living standard could dilute the statistical significance of the latter. Kim et al. (2003) reported that perceived health status was a well-known risk factor for depressive symptoms. Thus, the present result corresponds well with prior research.

Those who have low body image satisfaction tend to have low self-esteem (Secord, Jourard, 1953), and those who have low self-esteem have a tendency to avoid confrontations and difficult situations rather than actively coping with them (Kang, 2000). That is, low body image satisfaction could represent a negative self-image, a negative view of reality, and a negative view of the future, which together indicate the negative cognition of depression. Body image satisfaction proved to be the factor carrying the highest risk in the present study, in agreement with Thomp-

son's research (1990), which suggested that low body image satisfaction was associated with lowered self-esteem, increased depression, and increases in general psychological problems.

The limitations of the present study include, as mentioned above, the fact that this study was cross-sectional in design; thus, we could not define causal relationships between depression, body satisfaction, life satisfaction, and perceived health status. Second, the results of this study may differ from previous reports that have used diagnostic interviews because the BDI is not a diagnostic tool but, rather, a screening tool. Thus the results of the present study could reflect hopelessness or helplessness, which can be seen in maladaptive groups, rather than true clinical depression.

To further define risk factors for depression in students in the future, a prospective study is needed, in addition to a comparative study of the prevalence of depression and depressive symptoms and their correlates between Jeju and other areas.

V. CONCLUSION

Depression decreases the quality of life and can lead students to have a dim view of their future, due to a negative view of self, a negative view of reality, and a negative view

of the future in general(Beck, 1967). Thus, it is very important to find and treat depression and depressive symptoms at an early stage. Therefore, universities and colleges should provide programs that evaluate students' body image and provide education that encourages the development of a healthy body image. Also, they should focus on various scholarships that could improve satisfaction with life, especially for alienated students. Students should be provided with health education and regular health checks to give them greater confidence in their health status. Furthermore, we should encourage students to engage in more productive work, and guide social policies toward diluting the dominance of the importance of appearance.

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ABSTRACT

Objectives: The aim of the present study was to determine the prevalence depressive symptoms, and the correlates of depressive symptoms, and to propose countermeasures for individual depression risk factors among college students.

Methods: One university and three colleges in Jeju-do were selected as the study population and a total of 1000 students were selected by multiphasic cluster sampling to represent each department and year within each college. Of the 945 total respondents, 421 were men and 524 were women. The Beck Depression Inventory was used to evaluate depression and the BDI STEN score was used to assess depressive symptoms. Multiple logistic regression analysis was performed for comparisons.

Results:

1. The prevalence of depressive symptoms among men was 14.4%, while among women the level rose to 26.8%.

2. Those with poor life satisfaction scores were significantly more likely to have depressive symptoms than those with good life satisfaction (odds ratio (OR) = 2.62; 95% confidence interval (95%CI), 1.483-4.629).

3. Students over 23 years old were significantly more likely to have low levels of depressive symptoms than those under 18 (OR = 0.439; 95%CI, 0.247-0.779).

4. Groups with poor body image satisfaction had higher levels of depressive symptoms when compared to respondents who had good body image (OR = 2.847; 95%CI, 1.341-6.045).

5. Students with poor perceived health status were significantly more likely to have high levels of depressive symptoms than those with good perceived health status (OR = 2.029; 95%CI, 1.157-3.557).

Conclusion: Universities and colleges should provide education programs, such as health education that facilitates the development of a healthy body image. In addition, they should focus on various scholarships that could improve satisfaction with student life, especially for alienated students. Furthermore, colleges should help direct students towards engagement in more productive work, and lead social policies away from the dominance of appearance.

Key words: Depression, Depressive symptoms, College student, Risk factors