DEPRESSION AND RELATED PROBLEMS IN UNIVERSITY STUDENTS

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Method: Depression and related problems were studied in a sample of 283 university students. Results: The students with high depression scores also had high scores on anxiety, intrusive thoughts, controlling intrusive thoughts and sleep disturbances scales. A stepwise regression suggested that those problems contributed to a significant proportion of the variance (49%) on the depression scores. Conclusion: The two subscales of the depression scale that were most highly correlated with these variables were the depressed affect and the vegetative symptoms subscales.

Keywords: depression; university students; anxiety; sleep disturbances

The incidence of depression in university students is relatively high in many countries, ranging from: 1) 16% in a large survey study in Michigan (Eisenberg et al 2007); 2) to being more prevalent in a university population than in the public in general in London (Andrews et al 2006); 3) to being "prevalent" in Australia (Khawaja & Bryden, 2006); 4) to approximating 23% in Nigeria (Aniebue & Onyema, 2008); 5) to 27% in Turkey (Bayram & Bilgel, 2008); 6) to numbers ranging from 9% for major depression episodes (Vazquez & Blanco, 2008) to 33% for depressive symptoms in Spain (Vazquez & Blanco, 2006); and 7) to a range between 21% for major depression (Tomoda et al, 2000) and 33% for mild depression in Japan (Kawada et al, 2007). Wide variations in depression symptoms were also observed between countries in a very large sample of university students from 23 high, middle and low income countries (Steptoe et al, 2007). In that study, lower levels were reported in western and southern Europe as well as South and North America, intermediate levels in central and eastern Europe and higher levels in Pacific-Asian samples. Although the reasons for these wide variations are unknown, they could relate to the use of different measures (e.g. diagnostic versus self-reports,

ratings of depression, making it difficult to compare results), non-representative and/or small samples (as in countries with non-centralized treatment settings) or simply cultural differences.

The incidence of depression in university students is not only increasing in foreign countries but also in the U.S. In a 2005 national survey of college counseling center directors, 86% reported an increase in severe psychological problems including depression (Gallagher et al, 2005). This increasing incidence is problematic given that Major Depression Disorder in adulthood has its first onset during or shortly before college age (Kessler et al, 2005).

These incidence data highlight the importance of understanding depression and related problems in university students. Among the most commonly reported problems related to depression are anxiety, intrusive thoughts, controlling intrusive thoughts and sleep disturbances. Various studies have reported relationships between depression and one or more of these variables. However, this group of problems has not been assessed in the same sample. The purpose of this study was to assess all of these problems in one sample to determine the extent to which they are related to and the relative degree to which these problems contribute to the university students' depression. Knowing the relative importance of these variables can help formulate treatment strategies.

Evidence for these depression-related problems comes from studies where only one or two of these conditions were studied. Anxiety has often been comorbid with depression in university students as it is in adults (Andrews & Wilding, 2004; Eisenberg et al, 2007). For example, in one study 27% of university students were depressed, and 47% of those students also received high anxiety ratings (Bayram & Bilgel, 2008), with higher anxiety scores among the female students. And, both depression and anxiety have been associated with intrusive thoughts, controlling intrusive thoughts and sleep disturbances (Dusselier et al, 2005).

The literature on intrusive thoughts suggests that they are associated with both depression (Tanaka et al, 2006; Ciesla & Roberts, 2007) and anxiety (Nolen-Hoeksema, 2000). Some have noted intrusive thoughts as a significant predictor of depression scores (Ito et al, 2006; Starr & Moulds, 2006), while others have tried to manipulate intrusive thoughts. For example, in one study, participants were given a sad mood induction and then were asked to either think about their intrusive thoughts or get distracted (Ciesla & Roberts, 2007). Intrusive thoughts were more strongly associated with depression, consistent with other research (Kuehner et al, 2009).

Controlling intrusive thoughts has also led to depression (Nolen-Hoeksema, 1991) and to insomnia (Hobson et al, 2000). And, deliberate thought suppression efforts, regardless of the content, has led to more negative consequences (Belloch et al, 2004). Suppression of intrusive thoughts has paradoxical effects in that it produces the very thoughts that were intended to be avoided or controlled and subsequent sleep disturbances (Marcks & Woods, 2004).

Sleep disturbances may result in part from intrusive thoughts and attempting to control them and, in turn, lead to depres-

sion. And depression can contribute to sleep disturbances, as in a circular process with bidirectional effects. In any case, sleep disturbances are a prevalent problem in college students, usually taking the form of greater latency to sleep and more awakenings (Moo-Estrella et al, 2005), and often significantly correlated with depression (Vazquez & Blanco, 2006; Kawada et al, 2007), although in one study only in females (Kawada et al, 2007). This may relate to depression scores being higher in female as compared to male university students (Vazquez & Blanco, 2006).

The purpose of the present study was to determine the relative contribution of these problems to depression including anxiety, intrusive thoughts, controlling intrusive thoughts and sleep disturbances. Standardized scales were used for depression and anxiety, and measures adapted for university students were used for intrusive thoughts, controlling intrusive thoughts and sleep disturbances (Field et al, 2009). Regression analyses were conducted to determine the relative degree to which these variables contributed to the university students' depression. To explore the relationships between specific depression symptoms such as depressed affect and vegetative symptoms, the subscale scores on the depression scale and the intrusive thoughts, controlling intrusive thoughts and sleep disturbances variables were entered into a correlation analysis.

Methods

Participants

The sample was comprised of 283 university students (78% female) who averaged 21.3 years of age and had completed a mean of two years college education. Their ethnicity was distributed 70% Hispanic, 12% African-American, 10% Caucasian and 8% other.

Procedures

For this anonymous questionnaire study, university students were recruited from psychology classes at a southeastern U.S. university. The students were given extra credit for their participation. During one of their class sessions, the students completed a 120-item questionnaire comprised of demographic questions and scales on depression (CES-D), anxiety (STAI), intrusive thoughts (ITS), controlling intrusive thoughts (CITS), and sleep disturbances (SDS).

The sample (N=283) was divided into high and low depression groups based on the depression cutoff score (16) on the Center for Epidemiological Studies-Depression Scale (CES-D). No differences were noted between these two groups on any of the demographic variables (ethnicity, gender, age, grade).

Measures

The Center for Epidemiological Studies-Depression Scale (CES-D) (Radloff, 1977) is a 20-item scale that assesses the frequency of depressive symptoms within the last week. The scores range from 0 to 60. The cut-off score of 16 is used for clas-

Table 1. Items on the subscales of the Center for Epidemiological Studies-Depression Scale (CES-D).

Depressed affect
Blues
Depressed
Lonely
Crying spells
Sad
Positive affect (reverse scored)
Just as good as others
Hopeful re: future
Happy
Enjoying life
Somatic/Vegetative
Bothered by things
Concentration problems
Everything is an effort
Sleep problems
Difficulty getting going
Interpersonal distress
People are unfriendly
People dislike me

sifying depression. With only a 6% false positive and 36% false negative rate (Myers & Weissman, 1980), the scale has been shown to be reliable and valid for diverse demographic groups. This scale was used to divide the sample into depressed and non-depressed groups to then be compared on the primary variables being studied. The scale features 4 subscales including depressed affect, positive affect, vegetative symptoms and interpersonal distress (See subscale items in Table 1).

The State Anxiety Inventory (STAI) (Spielberger et al, 1970) is comprised of 20 items and assesses the intensity of anxiety symptoms. The scores range from 20 to 90, and the cut-off score for high anxiety is 48. Research has demonstrated that the STAI has adequate concurrent validity and internal consistency (Spielberger et al, 1970). This scale was included inasmuch as anxiety is frequently comorbid with depression.

The Intrusive Thoughts Scale (ITS) (Field et al, 2009) is comprised of 4 items rated on a Likert scale from 1 (not at all) to 4 (very much so) including: 1) approximately how often per day would you say you have intrusive thoughts?; 2) how distressing are the intrusive thoughts?; 3) how vivid are the intrusive thoughts?; and 4) how much does the event appear to be happening now instead of happening in the past? Cronbach's alpha for this scale was .84 (Field et al, 2009). This scale was used in this study because of the frequency of intrusive thoughts among those who are depressed.

The Difficulty Controlling Intrusive Thoughts Scale (DCITS) (Field et al, 2009)

was adapted from the Thought Control Questionnaire (TCQ) (Wells & Davies, 1994). The Thought Control Questionnaire (TCQ) was developed to measure individual differences in the use of thought control strategies. Items were selected from the TCQ (19 of 30 items), their wording was slightly modified to be appropriate for university students, and the items were rated on a different scale, i.e. a Likert scale ranging from 1 (not at all) to 4 (very much so) (Field et al, 2009). The adapted scale includes, for example, items like "I get angry at myself for having intrusive thoughts", "I tell myself not to think about them now", "I try to block them out by reading, watching T.V. or playing with the computer" and "I dwell on other thoughts". Cronbach's alpha for this scale was .87 (Field et al, 2009). This adapted scale was included because of the difficulty controlling intrusive thoughts by depressed individuals.

The Sleep Disturbances Scale (SDS) (Field et al, 2009) is comprised of 4 items rated on a Likert scale from 1 (none) to 4 (a lot), including: 1) trouble falling asleep last night; 2) trouble with disrupted sleep last night; 3) amount of sleep last night; and 4) amount of exhaustion this morning. Cronbach's alpha for this measure was .91 (Field et al, 2009). This scale was included because of the sleep disturbances frequently noted in depressed students.

Results

ANOVAs were conducted on the primary variables of interest to determine differences between the depressed and non-depressed groups. As can be seen in Table 2, the depressed group as compared to the non-depressed group had higher scores on the: 1) Anxiety scale (STAI); 2) Intrusive Thoughts Scale (ITS); 3) Controlling Intrusive Thoughts Scale (CITS); and 4) Sleep Disturbances Scale (SDS).

A stepwise regression was then conducted on the depression scores, entering the primary variables of interest as the potential predictor variables. As can be seen in Table 3, anxiety (STAI) contributed to the largest amount of variance at 44%, the Controlling Intrusive Thoughts Scale added another 3% to the outcome variance, the Sleep Disturbances Scale added another 2% to the outcome variance to total 49% of the outcome variance. Because anxiety contributed to most of the variance, as might be expected due to the significant comorbidity of depression and anxiety, we

Table 2. Mean scores for depressed and non-depressed groups (S.D.s in parentheses).

Scales	Depressed	Non-depressed	F	p
Depression (CES-D)	21.04 (10.01)	6.84 (4.32)	31.14	.000
Anxiety (STAI)	51.06 (9.39)	34.50 (9.70)	177.08	.000
Intrusive Thoughts (ITS)	5.06 (3.14)	3.31 (2.67)	24.53	.000
Controlling Intrusive Thoughts (CITS)	23.56 (10.31)	19.23 (10.56)	11.74	.001
Sleep Disturbances (SDS)	5.67 (2.70)	3.51 (2.46)	43.07	.000

Table 3. Stepwise regression on depression (CES-D) scores

Step	R	R square	R^2 change	F for change
1	.66	.44	.44	165.01
2	.69	.47	.03	91.91
3	.70	.49	.02	66.97

Predictors in order of their entry
1 – Anxiety (STAI score)
2 – Controlling Intrusive Thoughts Scale
3 – Sleep Disturbances Scale

Table 4. Stepwise regression on depression (CES-D) scores excluding the comorbid anxiety (STAI) scores as a potential predictor.

Step	R	R square	R^2 change	F for change	p
1	.46	.21	.21	57.19	.000
2	.56	.32	.11	34.06	.000
3	.58	.34	.02	7.33	.007

Predictors in order of their entry
1 – Sleep Disturbances Scale
2 – Intrusive Thoughts Scale
3 – Controlling Intrusive Thoughts Scale

Table 5. Significant correlation coefficients for relations between CES-D subscales and other scales.

	CES-D Subscales			
	Depr. Affect	Pos. Affect	Vegetative Symptoms	Interper. Distress
Scales				
Intrusive Thoughts (ITS)	.44		.45	.21
Controlling Intrusive Thoughts (CITS)	.36		.41	.25
Sleep Disturbances (SDS)	.32	.24	.52	.26
Anxiety (STAI)	.57	.53	.59	.36

All ps < .001

conducted a second regression without the anxiety scores. In this second regression, as can be seen in Table 4, sleep disturbances contributed to 21% of the variance, intrusive thoughts to an additional 11% of the variance and controlling intrusive thoughts to an additional 2% of the variance. These factors together contributed

to 34% of the variance on depression.

To further explore the way depression symptoms relate to these variables, the depression subscales were entered into a correlation analysis with the primary variables of interest including the depressed affect, positive affect, somatic/vegetative symptoms and interpersonal distress subscales (see Table 1 for the items on the subscales). As can be seen in Table 5, the two subscales that were most highly correlated with the primary variables were the depressed affect and the vegetative symptoms subscales.

Discussion

The high incidence of depression in this sample (52% of the females being depressed) may possibly relate to the majority of the sample being Spanish female psychology students. This is a university student group that appears to be particularly affected by depression, not only in the U.S., but also in Spain (Vazquez & Blanco, 2006). The greater incidence of depression among the female students is not surprising given the 2 to 1 ratio cited for adult female versus male depression (Hyde et al, 2008). The sleep EEG and depression literature suggests that there is an inherent increased vulnerability to depression and insomnia in women (Brand et al, 2010) that may arise out of basic gender differences in brain organization and state regulation (Brand et al, 2010).

That anxiety explained most of the variance on depression in the first regression was not surprising inasmuch as those two mood states are frequently comorbid even in university students (Dusselier et al, 2005).That the Intrusive Thoughts Scale scores did not enter the first regression is somewhat surprising given the many reports of intrusive thoughts among university students (Ciesla & Roberts, 2007; Ito et al, 2006). Instead, the Controlling Intrusive Thoughts Scale scores entered the first regression to explain a significant amount of the variance in depression. The paradoxical phenomenon of trying to control intrusive thoughts and instead creating more intrusive thoughts has come to be known as the "white bear" phenomenon for "seeing" more white bears when you are trying to not think about white bears (Wegner et al, 1987). Almost invariably, in experimentally controlled conditions where one group was asked to suppress intrusive thoughts while another group was instructed to monitor them, the deliberate thought suppression efforts, regardless of their content, had greater negative consequences than non-suppression (Belloch et al, 2004). After removing the anxiety variable for the second regression, intrusive thoughts did contribute to a significant amount of the variance, and controlling intrusive thoughts contributed to less of the variance, highlighting the confounding effects of anxiety on depression as well as on the intrusive thoughts and controlling intrusive thoughts variables.

Sleep disturbances were a significant predictor of depression in the first regression and the most significant predictor when anxiety was omitted for the second regression. This was not surprising given other reports of sleep disturbances among depressed university students including a greater latency to sleep and a greater num-

ber of awakenings (Kawada et al, 2007; Moo-Estrella et al, 2005). As we have discussed elsewhere, sleep disturbances and depression are highly associated with physiological and biochemical imbalances (Field et al, 2006). These imbalances remain to be assessed in depressed university students in future studies. Certainly sleep disturbances would be expected to affect academic performance, which is another variable needing further study.

Given the high prevalence of depression and sleep disturbances in this mostly Hispanic sample and even higher incidences in Spain (81% depressed mood and 79% altered sleep) (Vazquez & Blanco, 2008), there is growing concern for these students not receiving psychiatric treatment. In one university study, as many as 85% of the students with moderately severe or severe depression and 84% of those with current suicidal ideation were not receiving psychiatric treatment at the time of assessment (Garlow et al, 2008).

In summary, all of the variables studied here appeared to contribute to the depression of university students including anxiety, intrusive thoughts, controlling intrusive thoughts and sleep disturbances. These problems would also be expected to contribute to limited concentration and academic performance which have surprisingly been relatively ignored in the university student literature, although depression has predicted a decrease in exam performance from the first to the second year of university life (Andrews & Wilding, 2004), and, sleep disturbances have been related to performance issues (Azevedo et al, 2010). Further studies are needed to explore the effects of these variables on academic performance and how to treat these variables so that they do not continue to be problematic for university students.

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