Sleep is an essential part of one’s life and sleep deprivation or poor sleep can have negative effects on one’s overall mental health. Pilcher, Ginter, and Sadowsky (1997) posited that health and well-being measures were better related to sleep quality than sleep quantity, and that poor sleep quality was associated with increased mood states of tension, depression, anxiety, fatigue, and confusion. Similarly, Meijer, Habekothé, and Van Den Wittenboer (2001) reported a strong relationship between sleep quality and mental health characteristics, such as emotional stability. Sleep quantity is still an important factor, however, as Roberts, Roberts, and Chen (2002) found that insomnia constitutes a significant risk factor for future somatic dysfunction including perceived health, somatic health problems, and reported impact of illness on family life.

In addition to sleep quality and quantity being risk factors for mood fluctuations, sleep variables have also been associated with psychiatric disorders. The direction of the relationship between sleep and psychiatric disorders seems to be unclear. Perhaps sleep abnormalities are an expression of psychiatric problems or opposingly sleep disturbances may be a causal factor of psychiatric problems. Andrews and Oei (2004) found that insomnia is one of the most common early signs of major depression. But it is unclear whether insomnia is secondary to depression, or whether depression is secondary to insomnia. In either case, sleep disturbances may act as a warning sign for the risk of psychiatric disorders. For example, Hidalgo and Caumo (2002) found that daytime sleepiness, insomnia, and less than seven hours of sleep per night have been related to minor psychiatric disorders in medical students. Paavonen, Solantaus, Almqvist, and Aronen (2003) found correlations between psychiatric symptoms and sleep disturbances, and concluded that children with sleep disturbances demonstrated a greater risk for psychiatric problems than non-sleep disturbed children. Ford and Kamerow (1989) noted the prevalence of psychiatric disorders, specifically depression and anxiety, was much higher in those who complained of sleep disturbances. In fact, depression and anxiety are two of the most common symptoms associated with sleep complaints (Andrews & Oei, 2004; Ford & Kamerow, 1989). Morin, Rodrigue, and Ivers (2003) found that people with insomnia reported more intense symptoms of depression and anxiety than did indi-

**The Role of Sleep, Stress, and Coping Styles on Anxiety and Depression**

*Previous research has examined the relation between sleep and mental health in adolescent and elderly populations. The goal of this study was to examine the relation between college students’ sleep habits and their mental health, particularly anxiety and depression. It was found that individuals with sleep disturbances may be at risk for depression and anxiety. Another goal of this study was to do an exploratory analysis of stress, coping strategies, gender, and sleep to discover which variables would best predict depression and anxiety. Avoidant coping was the best predictor followed by sleep disturbances for both depression and anxiety. The gender of an individual was also found to have a negative effect on one’s sleep, specifically for a woman.*

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*Faculty supervisor*
viduals without insomnia. Taylor, Lichstein, and Durrence (2003) concluded that insomnia is a predictor of depression, anxiety disorders, and other psychological disorders (see also Ford & Kamerow, 1989). Finally, Hasler et al. (2005) concurred by recognizing the existence of strong associations between excessive daytime sleepiness and both depression and anxiety disorders.

Studies indicate that there is a direct relationship between sleep complaints, sleep abnormalities, and depression (De Gennaro, Martina, Curcio, & Ferrara, 2004; Ford & Kamerow, 1989). Berger, van Calker, and Riemann (2003) noted that chronic insomnia may in and of itself become a risk factor that triggered depression. Hatzinger, Hemmeter, Brand, Ising, and Holsboer-Trachsler (2004) found that people experiencing a long-term course of depression have increasingly abnormal sleep regulation, which may predict treatment response during their depression, as well as long-term recurrences of depression.

Gregory et al. (2005) found a link between persistent sleep problems in childhood and diagnosed anxiety in adulthood and suggested that both anxiety and sleep problems have underlying risk factors. One underlying risk factor may be stress. Phillips, Hammes, Brennan, Najman, and Bor (2005) found that anxiety disorders may be related to early stress exposure. Their results implicate a possible developmental process in which early distress indicates early onset of anxiety disorders. Phillips et al. (2005) noted that some children may be more vulnerable to the development of depressive disorders either due to their negative family environments or due to severe levels of stress independent of familial conditions. They also noted that depressive disorders are more likely to be triggered by severe acute stressors. Joiner, Wingate, Gencoz and Gencoz (2005) raised the possibility that depressive symptoms may generate the perception but not the occurrence of stress. They also found that hopelessness is a key aspect of depression and that depression chronicity may be implicated in the generation of actual stress.

The way in which an individual handles a stressful situation, rather than the actual stress itself, may be important in predicting depression and anxiety. According to Lazarus (1990), once an individual has assessed a situation as stressful, coping strategies are used to maintain the individual’s stability. Coping strategies are referred to as efforts used to manage demands that are appraised as a strain on one’s resources (Lazarus & Folkman, 1984). Thus, coping strategies are efforts made to reduce or minimize stressful events. Researchers generally recognize two types of coping strategies: problem-focused coping and emotion-focused coping. Individuals employing problem-focused coping strategies directly focus on the stressor, where the terms of the relationship are changed, affecting the appraisal process. Individuals employing emotion-focused coping strategies address the consequences of the stressor, but not the stressor itself, and an individual may deny or distance themselves from the threat, thus affecting the appraisal process (Lazarus, 1990). In addition to problem-focused and emotion-focused coping, some researchers argue that there is a third type of coping, called avoidant coping. Individuals employing avoidant coping strategies attempt to avoid confronting the situation or try to reduce the emotional tension of a problem (Billings & Moos, 1981).

Morin et al. (2003) focused on coping strategies in relation to sleep and stress. These authors concluded that insomniacs, when facing stressful situations, rely more on emotion-focused coping strategies. This coping strategy indirectly influences their sleep efficiency by increasing the stress impact. Seiffge-Krenke and Klessinger’s (2000) research on problem-focused coping concluded that individuals who use this form of coping display lower levels of depression. Research has also found that individuals who rely on avoidant coping report more depression (Seiffge-Krenke & Klesslinger, 2000), and more anxiety (Leverant, Hofmann, & Litz, 2004).

Another factor impacting mental health in relation to coping and sleep is one’s gender. One study found that male college students were more inclined to use problem-focused coping strategies, whereas women were more inclined to use emotion-focused coping strategies (Ptacek, Dodge, & Smith, 1994). Blalock and Joiner (2000) found that the negative effects of avoidant coping on one’s mental health was only true for a woman. In addition, Breslau, Roth, Rosenthal, and Andreski (1996) found that women report higher rates of insomnia than do men. Ford and Kamerow (1989) posited the prevalence of insomnia is significantly higher for women, with small differences in the incidence rates between the genders. Excessive daytime sleepiness has also been linked to one’s gender. Hasler et al. (2005) reported that the prevalence of excessive daytime sleepiness increased with age for both men and women, and at any age, women had higher prevalence rates. Lavidor, Weller, and Babkoff (2002) posited women to have higher levels of fatigue. They also reported that depression levels were correlated with fatigue on six out of seven fatigue factors, indicating a possible effect of gender.

Most research has focused on adolescent and elderly populations when trying to understand the relationship between sleep and mental health. The goal
of the present study is to examine college students’ mental health, particularly anxiety and depression, in relation to their sleep-wake cycles. In addition, another purpose of this study is to examine coping strategies, sleep, and stress and its relation to mental health. Specifically, this study assessed that variables that are considered risk factors for the development of depressive and anxiety disorders. It is necessary to investigate these variables in relation to mental health facets in an attempt to prevent and better treat psychiatric disorders.

It was hypothesized that there would be a negative relationship between sleep disturbances in both quality and quantity and mental health, such that individuals with poor sleep will report greater instances of depression and anxiety. Exploratory analyses of stress, individual coping styles, gender, and sleep were conducted to discover which variables were the best predictors of depression and anxiety. Specifically, the questions asked where whether stress or sleep were predictors of depression and anxiety; whether problem-focused, emotion-focused, or avoidant coping strategies were better predictors of depression and anxiety; and whether gender was a predictor of depression and anxiety. Because these analyses were exploratory, no specific hypotheses were made.

Method

Participants

Data were collected from 378 Boise State University students from a General Psychology participant pool. All students received course credit for their participation. There were 228 (60.3 %) women, and 150 (39.7 %) men. There were 257 (68 %) freshmen, 82 (21.7 %) sophomores, 30 (7.9 %) juniors, and 9 (2.4 %) seniors. There were 290 (76.7 %) participants who were of single status, 46 (12.2 %) who were married, 12 (3.2 %) who were divorced, 1 (.3 %) who was widowed, and 27 (7.1 %) who were cohabitating. There were 210 (55.6 %) participants who worked part-time, 83 (22 %) who worked full-time, 82 (21.7 %) who were unemployed, 3 (.8 %) who were retired. Three hundred twelve (82.5 %) participants were White, 10 (2.6 %) participants were African American, 29 (7.7 %) participants were Hispanic, 14 (3.7 %) participants were Asian, and 12 (3.2 %) were classified as “other.”

Materials

The participants were asked questions that focus on depression, anxiety, sleep, and coping strategies in relation to stress as described below.

Depression. Depression was measured using the Center for Epidemiologic Studies Depression Scale (CES-D, Radlof, 1977). The CES-D is a Likert-type questionnaire that contains 20 questions examining self-reported feelings or behaviors during the past week. Students responded to the questions based on a 4-point scale ranging from 1 (rarely or none of the time to less than 1 day) to 4 (most of all the time to 5-7 days). Responses were summed and a scale score was created (α=.89).

Anxiety. Anxiety was measured using the Mehrabian Trait Anxiety Scale (Mehrabian, 1994). The Mehrabian Trait Anxiety Scale is a Likert-type questionnaire containing 16 questions examining personal characteristics. Students responded to the questions based on a scale ranging from -4 (extremely inaccurate) to +4 (extremely accurate) with a score of 0 indicating neither accurate nor inaccurate. See Mehrabian (1994) for scoring instructions and information on reliability and validity.

Sleep. Sleep variables were measured using the Pittsburgh Sleep Quality Index (PSQI, Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). The PSQI is a Likert-type questionnaire containing nine questions examining sleep habits during the past month. Students responded to the questions based on a 4-point scale ranging from 0 (not during the past month) to 3 (three or more times a week). See the Buysse et al. for scoring instructions (α=.83).

Stress. Stress was measured using the Student Stress Scale (Insel & Roth, 1994). The Student Stress Scale is designed to examine 31 stressful life events experienced in the past 6 months or that are likely to be experienced in the next 6 months. Points are assigned based on their severity, ranging from 20 (minor traffic violations) to 100 (death of a close family member). Responses were summed. The scale demonstrated good internal consistency in our study (α=.95).

Coping. Coping styles were measured using a Coping with Stress scale (Holahan & Moos, 1987). The Coping with Stress scale is a Likert-type questionnaire that contains 32 questions identifying problems faced in the last year and indicates how often students used each coping strategy to deal with their problems. Students responded to the questions based on a 4-point scale ranging from 0 (not at all) to 3 (fairly often). Coping styles were grouped into three categories: problem-focused, emotion-focused, and avoidant based on previous research (see Holahan & Moos; Wilson, Pritchard, & Revalee, 2005).

Procedure

The participants were in a large group and surveyed in a classroom setting. As the survey was anonymous, the introductory survey paragraph served as the informed consent. They were offered 50 min to complete the survey, with the average participant using
### TABLE 1

**Summary of Stepwise Regression Analysis for Variables Predicting Depression (N = 378)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE, B$</th>
<th>$\beta$</th>
<th>Model F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Depression</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance coping</td>
<td>11.51</td>
<td>1.08</td>
<td>.52*</td>
<td>114.62*</td>
</tr>
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<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance coping</td>
<td>8.96</td>
<td>1.04</td>
<td>.41*</td>
<td>98.99*</td>
</tr>
<tr>
<td>Sleep</td>
<td>.50</td>
<td>.06</td>
<td>.37*</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance coping</td>
<td>9.10</td>
<td>1.03</td>
<td>.41*</td>
<td>68.50*</td>
</tr>
<tr>
<td>Sleep</td>
<td>.49</td>
<td>.06</td>
<td>.36*</td>
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<tr>
<td>Emotion-Focused coping</td>
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<td>.92</td>
<td>-.10</td>
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</tr>
<tr>
<td>Step 4</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance coping</td>
<td>9.00</td>
<td>1.03</td>
<td>.41*</td>
<td>53.25*</td>
</tr>
<tr>
<td>Sleep</td>
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<td>.06</td>
<td>.36*</td>
<td></td>
</tr>
<tr>
<td>Emotion-Focused coping</td>
<td>-3.96</td>
<td>1.26</td>
<td>-.19</td>
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<tr>
<td>Problem-Focused coping</td>
<td>2.71</td>
<td>1.23</td>
<td>.14</td>
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</tr>
</tbody>
</table>

*Note:* $p < .01$

### TABLE 2

**Summary of Stepwise Regression Analysis for Variables Predicting Anxiety (N = 378)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE, B$</th>
<th>$\beta$</th>
<th>Model F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anxiety</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Avoidance coping</td>
<td>19.19</td>
<td>2.44</td>
<td>.42*</td>
<td>61.90*</td>
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<td>Step 2</td>
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<td>Avoidance coping</td>
<td>14.61</td>
<td>2.45</td>
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<tr>
<td>Sleep</td>
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<td>.31*</td>
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</tr>
<tr>
<td>Step 3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance coping</td>
<td>14.35</td>
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<td>46.34*</td>
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<tr>
<td>Sleep</td>
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<td>.28*</td>
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</tr>
<tr>
<td>Sex</td>
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<td>2.07</td>
<td>-.26*</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance coping</td>
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<td>.33*</td>
<td>39.84*</td>
</tr>
<tr>
<td>Sleep</td>
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<td>.14</td>
<td>.26*</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-12.02</td>
<td>2.05</td>
<td>-.29*</td>
<td></td>
</tr>
<tr>
<td>Emotion-Focused coping</td>
<td>-7.72</td>
<td>2.07</td>
<td>-.18*</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* $p < .01$
30 min. The surveys were distributed anonymously and the participants were debriefed immediately following survey completion about their participation after the study.

Results

Sleep

Correlation coefficients showing the relationship between sleep and depression revealed a significant association. Poorer sleep, in both quality and quantity, as measured together by the PSQI, was positively associated with depression, \( r(309) = .50, p < .01 \), indicating that individuals with poorer sleep tended to have more incidences of depression.

Correlation coefficients showing the relationship between sleep and anxiety revealed a significant association, \( r(291) = .42, p < .01 \). This association indicates that individuals with poorer sleep quality and quantity also have higher levels of anxiety.

Predictors of Depression and Anxiety

To examine which of the six factors (stress, sleep, problem-focused coping, emotion-focused coping, avoidant coping, or gender) had the strongest relationship to depression and anxiety, a separate stepwise regression for each variable was conducted for both dependent variables. For depression, avoidance coping was the primary variable, followed by sleep, then emotion-focused coping, and finally problem-focused coping (see Table 1). For anxiety, avoidance coping was the primary variable, followed by sleep, then gender, and finally emotion-focused coping (see Table 2).

Discussion

The first goal of the present study was to identify the relationship between sleep disturbances and mental health. It was found that individuals who scored high on the PSQI also scored high on the CES-D. Similar to previous research (Berger et al., 2003; De Gennaro et al., 2004; Ford & Kamerow, 1989; Hatzinger et al., 2004), our results indicate that poorer sleepers, in both quality and quantity, showed more depressive symptomatology. It was also found that individuals who scored high on the PSQI scored high on the Mehrabian Trait Anxiety Scale, indicating that poor sleepers, in both quality and quantity, showed more anxious symptomatology. Our findings are in line with previous research indicating that anxiety is much more prevalent in individuals with sleep disturbances than those without sleep disturbances (Andrews & Oei, 2004; Ford & Kamerow, 1989; Morin et al., 2003; Taylor et al., 2003).

The second goal of the present study was to do an exploratory analysis of stress, coping styles, sleep, and gender to discover which variables were the best predictors of depression and anxiety. Given the evidence that individuals who rely on avoidant coping report more depression (Seiffge-Krenke & Klessinger, 2000), it was not surprising that avoidant coping was the best predictor of depression in the present study. The second strongest predictor of depression was sleep. However, as earlier research has suggested, it is unclear whether sleep disturbances are secondary to depression or whether depression is secondary to sleep disturbances (Andrews & Oei, 2004). The third strongest predictor of depression was emotion-focused coping. As previous research has indicated, individuals suffering from sleep disturbances rely more on emotion-focused coping (Morin et al., 2003). Thus, it is not surprising that emotion-focused coping is not as good of a predictor on depression as sleep. The last of the predictors was problem-focused coping. Our results are in line with previous findings, indicating that individuals employing problem-focused coping strategies display lower levels of depression (Seiffge-Krenke & Klessinger, 2000), hence it is not unexpected that problem-focused coping was the least predictive of depression. Neither stress, nor gender were predictors of depression.

Given the evidence that individuals who rely on avoidant coping report more anxiety (Liverant et al., 2004), it was not surprising that avoidant coping was the best predictor of anxiety. The second strongest predictor of anxiety was sleep. In congruence with previous research, sleep disturbances were much more prevalent in individuals suffering from anxiety (Andrew & Oei, 2004; Ford & Kamerow, 1989; Morin et al., 2003; Taylor et al., 2003), thus it was not unexpected that sleep disturbances were the second strongest predictors of anxiety. Given that evidence has also demonstrated women reporting higher rates of insomnia (Breslau et al., 1996; Ford & Kamerow, 1989) and being more inclined to use emotion-focused coping (Ptacek et al., 1994), it was not surprising to find that gender was the third strongest predictor of anxiety. The present results also indicated that emotion-focused coping is the fourth strongest predictor of anxiety. Neither problem-focused coping nor stress were predictors of anxiety.

Limitations

Despite our advances, several limitations of our study must be acknowledged. First, the majority of the students in this sample were White. This sample bias prevents us from exploring possible differences in ethnic groups as well as limiting the generalizability of
our findings to other ethnic groups. Second, the students in our sample were selected from an introductory psychology course who participated on a voluntary basis. Although the course is required for many university students, it may not be representative of the entire university population. Finally, our study was simply a survey of college students, whose sleep habits of may not be representative of other populations. Our findings might have been different had we tried to predict the effects of long-term stressors, sleep complaints, gender, and coping styles on depression and anxiety as measured in middle-aged adults. Future studies should examine the associations between sleep and anxiety and depression in more diverse settings.

**Conclusion**

The results of the present study indicate that poorer sleepers report more depressive and anxious symptomology, which has implications for understanding the etiology of depression and anxiety and for possible prevention and treatment interventions. Avoidant coping, sleep, emotion-focused coping, and problem-focused coping related to depressive symptomology. Avoidant coping, sleep, gender, and emotion-focused coping related to anxious symptomology. Thus, these results suggest that focusing on avoidant coping styles, disrupted sleep, and emotion-focused coping can help to notice the early warning signs of depression and anxiety, as well as help us to prevent and to recognize an individual’s best treatment options when suffering from depression and/or anxiety. Psychologists need to realize the importance of coping styles and sleep when treating depression and anxiety, as both are predictors. It is also essential to realize that the risk factors are different for men and women, and different intervention strategies and treatment options should be considered.

**References**


THE ROLE OF SLEEP STRESS AND COPING STYLES  □  Lezamiz and Pritchard


