Student Health, Athletic Performance, and Education Study: Fourth Annual Report

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The University of Tulsa Institute of Trauma, Adversity, and Injustice (TITAN)

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IRB Approval

The initial SHAPE research study was approved by The University of Tulsa Institutional Review Board (IRB # 12-04) on October 18, 2011. During the Summer of 2013, we revised the IRB for the study to consolidate the athlete protocol with a separate protocol for non-athletes (IRB # 12-33) that had served as a comparison sample. We also revised study measures to reflect new priorities established for Year 2 of data collection. This revision was approved on July 8, 2013 and the study continues under the current protocol number (IRB # 13-84).

Method

During the Summer of 2011, the research team worked with the Athletic Director to determine goals for the first mental health needs assessment. The major goal was to improve athletic and academic performance for TU athletes by addressing behavioral health related concerns. The first step was to determine what those concerns were. The research team brainstormed key areas to target and generated a list of measures for the initial assessment which took place in Year 1 of the study.

Data collection from Year 1 indicated that there were several areas of concern that warranted additional follow up assessment. There were three key areas of concern that were incorporated into intervention planning for Year 2: daytime dysfunction and nighttime problems, obsessive compulsive symptoms, and experiences of racism. Year 2 data revealed that upon closer examination of objective measures, sleep problems were the most serious concerns for athletes, and therefore sleep and sleepiness measures were retained for Year 3 of the study. In addition, a measure of mental toughness was added to the assessment battery to gauge whether or not athletes may benefit from mental toughness training. Year 4 of the study was identical to Year 3, with the exception of the reassessment of sleep knowledge. Our goal was to examine if sleep knowledge gained in Year 2 was retained in Year 4 among those athletes that attended SHAPE sleep programming.

Athletes

Data collection was organized in consultation with coaches and training room staff and occurred either during physical exams at the beginning of the season or at team meetings. Athletes on each team completed the measures in a group setting. During the scheduled data collection session, a member of SHAPE introduced the purpose of the study and emphasized the voluntary nature of the project. Athletes who chose to participate (N = 244) signed an informed
consent form and indicated if researchers had permission to access their academic record through the athletics department. The majority of athletes participating in Year 4 \((n = 200, 82\%)\) gave permission for researchers to access their academic records.

**Non-athletes**

Each year of the SHAPE project, we also collected data from a comparison sample of non-athlete students. This comparison sample was recruited using the Department of Psychology Human Subjects Research Pool (HSP). In Year 4 of the project, Non-athletes \((N = 117)\) volunteered to complete measures that were a similar assessment battery to that completed by the SHAPE athletes. Non-athletes completed questionnaires anonymously and online through an electronically administered HSP. Non-athletes were able to log onto the system at any time during the semester and complete the questionnaires alone at a computer of their choosing.

**Demographics**

A total of 244 student-athletes volunteered to participate SHAPE research in Year 4 (63\% of all current athletes). The sample had participants from all of the NCAA Division I teams on campus. Athletes were approximately 20 years of age \((M = 19.5, SD = 1.3)\) and approximately an equal number of male (43.1\%) and female (56.9\%) athletes participated. Almost all of the participants reported their marital status as single (98\%), and one-quarter (26.4\%) reported having a boyfriend or girlfriend. Participants’ self-reported ethnicity and year in school are displayed in Figures 1 and 2 below.
Similar to athletes, non-athletes were approximately 20 years of age ($M = 20.3$, $SD = 3.7$) and reported similar racial diversity as the SHAPE athletes (65% Caucasian). In contrast to the athlete sample, the non-athlete sample was primarily female (75%). The time of day, time of the semester, participant demographics, and perceived anonymity may have influenced any observed group differences between athlete and non-athlete participants.

**Measures Used and Interpretation Guidelines**

**All-Conference Status.** To obtain an objective indicator of athletic performance, those who participated in the SHAPE project and who were also selected to an All-Conference team (American Athletic Conference) during the 2014-2015 athletic seasons were identified through the American Athletic Conference website. Specifically, athletes who received any level of All-Conference honors (e.g., first team, second team, all-freshman) were noted by researchers and included in analyses. From the website it was determined that 66 athletes at TU earned All-Conference honors during Year 4. Of those athletes that earned honors, about half (71%, $n = 47$) were SHAPE participants during Year 4. More All-Conference athletes were female (68.1%) than male (31.9%). In addition, All-Conference honorees were significantly older than non-honorees ($M = 20.04$, $SD = 1.6$ as compared to $M = 19.36$, $SD = 1.2$) and were equally likely to report being a racial or ethnic or minority as compared to those without honors.

**Current Stress.** Athletes completed two measures of stress. To assess the level of current stress, athletes completed the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). The PSS is a 10-item self-report questionnaire that measures individuals’ evaluation of the level of stress of situations in the past month of their lives. Each item is ranked on a 5-point Likert-type scale indicating how often an individual felt or thought a certain way during the past month (e.g., How often have you felt nervous or stressed?) on a scale ranging from 0 (never) to 4 (very often). Values are then summed to compute a total stress score where higher scores indicate more current stress.

**Athletic Stress.** Because student athletes face unique stressors related to their dual roles as athletes and students (e.g., Etzel, 2009), a second measure of stress examined sport-related stressors. To obtain an index of sports-related stress, athletes completed The College Student-Athlete’s Life Stress Scale (CSALSS; Lu et al., 2012). The CSALSS is a 24-item scale that measures eight factors: sports injury, performance demand, coach relationships, training adaption, interpersonal relationships, romantic relationships, family relationships, and academic
requirements. Responses were rated on a Likert scale that ranged from 0 (never) to 5 (always) where higher scores on this scale indicate higher stress level (e.g., I am annoyed by my injury because it has still not yet fully recovered).

**Coping.** Participants completed the Brief COPE to assess current coping styles (Carver, 1997). This 28-item self-report measure assesses how often an individual uses various coping strategies to deal with life stressors. Individual ratings are summed to compute 14 subscales of various coping behaviors. Each of those coping strategies is made up of two questions. Six of the strategies can be deemed maladaptive and eight are considered adaptive. Adaptive coping items focus on more active strategies which include: planning, positive reframing, acceptance, humor, religion, using emotional support, and using instrumental support. The maladaptive coping items include: self-blame, denial, venting, substance use, behavioral disengagement, and self-distraction. Responses range from 1 (I haven’t been doing this at all) to 4 (I have been doing this a lot).

**Mental Health Profile.** To provide a mental health profile of the SHAPE athletes, participants completed the Psychiatric Diagnostic Screening Questionnaire (PDSQ); (Zimmerman, 2002). The PDSQ is a validated measure commonly used in clinical settings for symptom screening (Zimmerman, 2002). The PDSQ has 14 subscales that screen for Axis I disorders commonly encountered in primary care. The PDSQ has been shown to have good sensitivity to detecting clinical concerns (Zimmerman & Chelminski, 2006). On each of the 14 subscales a cut-off score was used to determine if an athlete met PDSQ symptom threshold that is suggestive of a given disorder (Zimmerman, 2002). However, it is important to note that we cannot make diagnostic determinations from a single screening measure, and therefore the PDSQ serves as a screener and indicator of possible symptomatology.

**Mental Health Stigma.** To measure attitudes toward seeking professional psychological help, athletes were administered the Inventory of Attitudes Toward Seeking Mental Health Services (IASMHS; Mackenzie, Knox, Gekoski, & Macaulay, 2004). The IASMHS is brief self-report measure that explores attitudes toward seeking professional psychological help and is comprised of three subscales: psychological openness, help-seeking propensity, and indifference to stigma. Psychological openness measures how willing a person is to see psychological services as a beneficial option. Help-seeking propensity is how likely a respondent is to actually seek out psychological services if they are needed. Indifference to stigma measures how much
the respondent would be concerned about “important others” knowing about their psychological service use (Mackenzie, Knox, Gekoski, & Macaulay, 2004). The three subscales are measured on a 0 to 32 scale, with a score of 32 indicating the most positive attitudes possible. A total score is also given (the sum of the subscales) which ranges from 0 to 96, with 0 representing the most negative or stigmatized attitude, 48 being neutral, and 96 being the most positive attitude.

**Sleep Quality and Quantity.** To provide detailed information on sleep quality and quantity, SHAPE participants were asked to complete the Pittsburgh Sleep Quality Index (PSQI). The PSQI is a well-validated self-report measure that discriminates poor sleepers from good sleepers (Buysse, Reynolds, Monk, & Berman, 1989). The PSQI is scored to compute seven component scores including: subjective sleep quality (i.e., self-reported sleep quality), sleep latency (i.e., length of time to fall asleep), sleep duration (i.e., number of hours of slept), sleep efficiency (i.e., ratio of number of hours spent in bed to number of hours sleeping), sleep disturbances (e.g., snoring roommate), use of sleeping medication, and daytime dysfunction (i.e., daytime sleepiness). Each of these seven components is scored on a 0 to 3 range, with 3 indicating more sleep dysfunction. Summing the seven component scores on the PSQI yields a global score with a range from 0-21, with 21 representing the worst sleep score possible.

**Daytime Sleepiness.** Athletes completed the Epworth Sleepiness Scale (ESS; Johns, 1991). This is a brief, 8-item self-report scale that measures daytime sleepiness (e.g., “How likely are you to doze off while sitting and talking to someone?”). Items are rated on a scale of 0 (would never doze) to 3 (high chance of dozing). For example, total scores range from 0 to 24 with higher scores indicating greater sleepiness. Total scores above 10 are considered generally sleepy.

**Mental Toughness.** To obtain an index of Mental Toughness, athletes completed the Mental Toughness Questionnaire (MTQ-48; Clough, Earle, & Sewell, 2002). The MTQ-48 is 48-item measure that consists of four basic components: challenge, commitment, control (emotional and life), and confidence (interpersonal and abilities). Responses were rated on a Likert scale that ranged from 1 (disagree) to 5 (agree). The total possible score attainable on this measure is 240 (40 for challenge, 65 for control, 55 for commitment, and 75 for confidence). Higher scores on this scale mean higher MT levels.
Summary of Stress-Related Findings

- **Participant Characteristics and Stress**
  - Sport-related stress was measured with the College Student-Athlete’s Life Stress Scale (CSALSS). Current life stress was measured with the Perceived Stress Scale (PSS).
    - Sample Mean PSS = 14.5 ($SD = 6.2$)
    - Sample Mean CSALSS = 21.4 ($SD = 16.0$)
  - No gender differences were noted on life or sport-related stress.
  - No differences were found between 1st and 2nd year students and 3rd and 4th year students on life or sport-related stress.
  - Ethnic and racial minorities reported significantly more life stress than did non-minorities ($p = .011$). There were no differences observed for sport-related stress.
    - PSS $M_{minority} = 16.2$ ($SD = 6.1$)
    - PSS $M_{majority} = 13.7$ ($SD = 6.2$)
  - Athletes reported less current life stress than did non-athletes ($p < .001$).
    - PSS $M_{nonathlete} = 18.3$ ($SD = 6.4$)
    - PSS $M_{athlete} = 14.5$ ($SD = 6.2$)

- **Academic Performance and Stress**
  - Overall, athletes performed well during the Fall 2014 academic year ($M_{GPA} = 3.17$, $SD = .78$)
  - No relationship was observed between Fall 2014 GPA and reported life or sport-related stress.
    - However, among athletes with GPA’s lower than 2.0 ($n = 19$), there was a significant negative correlation with sport-related stress ($r = -.71$, $p = .002$). This may suggest that athletes report increasing levels of stress related to their athletic performance as their GPA decreases. Conversely, those athletes with higher levels of sport-related stress may be earning
lower GPAs. The association between stress and academics could also be due to some unknown variable.

- **Mental Health and Stress**
  - Current life stress was significantly associated with mental health symptoms of:
    - Depression, PTSD, Eating Disorders, Social Phobia, Alcohol and Drug Use, GAD, and overall PDSQ total symptom count.
    - This finding can be interpreted as either, athletes with more mental health symptoms also report more stress or, athletes with more stress report more mental health symptoms.
  - Reported sport-related stress was also associated with mental health symptoms of:
    - Depression, PTSD, Eating Disorder, OCD, Agoraphobia, Social Phobia, Somatization Disorder, Hypochondriasis, and PDSQ total symptom count.
    - This correlational finding can be interpreted as either, athletes with more mental health symptoms also report more sport-related stress or athletes with more sport-related stress report more mental health symptoms.

- **Sleep and Stress**
  - Reported stress was positively associated with several sleep measures.
    - **Current life stress (measured by PSS)**
      - Stress was significantly related to reported sleepiness on the ESS ($r = .201, p = .002$).
        - This can be interpreted as either more reported stress is associated with more daytime sleepiness or that more daytime sleepiness is associated with more reported stress.
      - Aspects of reported sleep quality and quantity were related with current life stress.
        - The Global PSQI was positively associated with total reported stress ($r = .235, p = .001$). This suggests that as sleep quality decreases the amount of reported stress
increases or conversely, an increase in reported stress is related to worse sleep quality.

- Several subscales of the PSQI were also related to the PSS:
  - Subjective Sleep Quality ($r = .222, p = .001$)
  - Sleep Latency ($r = .207, p = .002$)
  - Sleep Duration ($r = .236, p = .000$)
  - Sleep Disturbances ($r = .151, p = .016$)
  - Not related: efficiency and daytime dysfunction

- Current sport-related stress and sleep (measured by CSALSS)
  - Daytime sleepiness as measure by ESS ($r = .321, p = .000$)
  - Overall Sleep quality as indexed by the Global PSQI ($r = .224, p = .001$)
    - Subjective Sleep Quality ($r = .138, p = .025$)
    - Sleep Disturbances ($r = .139, p = .023$)
    - Daytime Dysfunction ($r = .217, p = .001$)
    - Not related: latency, duration, efficiency, sleep medication

- Coping and Stress
  - Stress was positively associated with coping mechanisms reported by student-athletes.
    - Current life stress
      - Maladaptive coping was related to current perceived stress such that athletes who reported more use of maladaptive coping strategies also reported more life stress ($r = .368, p = .000$).
      - Current perceived stress was not related to any adaptive coping measures.
    - Sport-related stress
      - Maladaptive coping was positively associated with total reported sport-related stress. In other words, more athletic stress was related to more reported maladaptive coping ($r = .557, p = .000$).
Similarly, adaptive coping was positively associated with total reported athletic stress such that more athletic stress was related to more reported adaptive coping ($r=.355$, $p=.000$).

**Summary of Mental Toughness Findings**

- Mental toughness (MT) is an individual’s conviction to achieve some goal, regardless of the stress and adversity one endures while doing so (Middleton et al., 2004). MT is often discussed as a multidimensional construct, meaning that several abilities make an athlete “mentally tough.” Clough (2000) discerned four major components of MT which are: challenge, control, commitment, and confidence.
  - *Challenge* is about perspective. There are people who perceive challenges as opportunities, and there are people who see them as threats. A mentally tough athlete perceives challenges as an opportunity.
  - *Control* focuses on the ability to believe that one can influence outcome regardless of the situation. One who is mentally tough will believe that he or she can adapt whereas one who is not mentally tough may not see him or herself as able to directly influence outcome due to other things they cannot influence.
  - *Commitment* is about persistence. Some people find it hard to stay focused on goals over long periods of time; mentally tough individuals are able to put aside day to day distractions or temptations in order to continue toward a long term goal.
  - Finally, the mentally tough individual will have *confidence* in his or her ability to be successful in completing a task, whereas lack of confidence is associated with lower levels of mental toughness (Clough, 2000).

**Participant Characteristics and Mental Toughness**

- See Table 1 for sample level descriptives.
- No gender differences were noted on any of the four components of mental toughness.
- No differences were found between 1st and 2nd year students and 3rd and 4th year students on Challenge, Commitment, or Control.
Interestingly, younger students reported significantly more Confidence than did older students:

- $M_{\text{lower}} = 3.5$ (SD = .58)
- $M_{\text{upper}} = 3.4$ (SD = .44)

Ethnic and racial minorities reported less Commitment and Control than did non-minority athletes. No differences were noted on the Challenge and Confidence facets of mental toughness.

- Commitment ($p = .002$)
  - $M_{\text{minority}} = 3.7$ (SD = .52)
  - $M_{\text{majority}} = 3.4$ (SD = .48)

- Control ($p = .009$)
  - $M_{\text{minority}} = 3.4$ (SD = .43)
  - $M_{\text{majority}} = 3.3$ (SD = .38)

Athletes reported significantly more mental toughness than did non-athletes. In fact, athletes reported higher mental toughness scores on all four facets of mental toughness.

- Commitment ($p < .001$)
  - $M_{\text{athlete}} = 3.6$ (SD = .52)
  - $M_{\text{non-athlete}} = 2.6$ (SD = .50)

- Control ($p < .001$)
  - $M_{\text{athlete}} = 3.4$ (SD = .43)
  - $M_{\text{non-athlete}} = 2.8$ (SD = .50)

- Challenge ($p < .001$)
  - $M_{\text{athlete}} = 3.5$ (SD = .59)
  - $M_{\text{non-athlete}} = 2.6$ (SD = .61)

- Confidence ($p < .001$)
  - $M_{\text{athlete}} = 3.5$ (SD = .53)
  - $M_{\text{non-athlete}} = 2.6$ (SD = .63)

All-conference athletes reported significantly more Control than non-honorees.

- $M_{\text{all-conference}} = 3.51$ (SD = .36)
- $M_{\text{non-honoree}} = 3.35$ (SD = .44)
Table 1.

*Mental Toughness Means and Standard Deviations Year 4*

<table>
<thead>
<tr>
<th>Mental Toughness Category</th>
<th>Likert Mean and SD</th>
<th>Score Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>3.50 ± .53</td>
<td>1-5</td>
</tr>
<tr>
<td>Interpersonal Confidence</td>
<td>3.45 ± .63</td>
<td>1-5</td>
</tr>
<tr>
<td>Abilities Confidence</td>
<td>3.55 ± .57</td>
<td>1-5</td>
</tr>
<tr>
<td>Control</td>
<td>3.38 ± .43</td>
<td>1-5</td>
</tr>
<tr>
<td>Emotional Control</td>
<td>3.15 ± .49</td>
<td>1-5</td>
</tr>
<tr>
<td>Life Control</td>
<td>3.58 ± .56</td>
<td>1-5</td>
</tr>
<tr>
<td>Commitment</td>
<td>3.61 ± .52</td>
<td>1-5</td>
</tr>
<tr>
<td>Challenge</td>
<td>3.47 ± .59</td>
<td>1-5</td>
</tr>
</tbody>
</table>

*Note.* Scores range from 1 to 5. Higher values indicate more mental toughness.

- **Mental Toughness and Sleep**
  - No associations were observed between measured mental toughness and sleep.

- **Mental Toughness and Mental Health**
  - Athletes who screened positive for more than one potential mental disorder on the PDSQ also reported less mental toughness:
    - Commitment ($r = -.229, p = .002$)
    - Control ($r = -.154, p = .043$)
    - Confidence ($r = -.151, p = .049$)
    - No relationship was observed between mental health and Challenge.

- **Mental Toughness and Coping**
  - Lower mental toughness construct scores were correlated with maladaptive coping behaviors:
Commitment overall maladaptive coping ($r = -0.220, p = 0.002$)
- Control and overall maladaptive coping ($r = -0.146, p = 0.046$)
- Confidence overall maladaptive coping ($r = -0.200, p = 0.006$)
- Challenge was not related to overall maladaptive coping
  - These correlations may suggest that individuals who engage in more maladaptive coping strategies (e.g., denial, substance use) also report less mental toughness. Alternatively, those athletes with less mental toughness may engage in more maladaptive coping strategies.

- Higher mental toughness scores were correlated with adaptive coping behaviors:
  - Challenge and overall adaptive coping ($r = 0.312, p = 0.000$)
  - Commitment and overall adaptive coping ($r = 0.191, p = 0.008$)
  - Control and overall adaptive coping ($r = 0.238, p = 0.001$)
  - Confidence and overall adaptive coping ($r = 0.148, p = 0.044$)
  - These correlations may suggest that individuals who engage in more adaptive coping strategies (e.g., active coping, planning, emotional support) report more mental toughness. Alternatively, those athletes with more mental toughness may engage in more adaptive coping strategies.

**Summary of Sleep Findings**

- **Sleep and Participant Characteristics**
  - No gender differences were found on either the PSQI Global or ESS.
  - No differences were observed between 1st and 2nd year students and 3rd and 4th year students on the PSQI or ESS.
  - No differences were found between ethnic and racial minorities and non-minorities on the ESS or PSQI
  - No statistically significant differences for better sleep habits and less daytime sleepiness were observed between all-conference and non-honoree athletes.

- **History of Sleep Education**
In Year 2 of the SHAPE Project two different evidence-based workshops were developed based on feedback from athlete focus groups. Broadly, the workshops aimed to inform athletes about the importance of sleep for both academic and athletic performance. Each workshop incorporated current research on sleep, performance, and health. The first workshop entitled, *The Power of Sleep*, specifically targeted the impact of sleep on health, injury prevention, and recovery from injury. The second workshop, *Sharpening the Edge*, presented recent research relevant to sleep and athletic and academic performance.

Assessment of sleep in Year 2 occurred prior to sleep education. Given the timeline of sleep education, we anticipated that, in general, 3rd and 4th year athletes would report more sleep knowledge than 1st and 2nd year athletes.

### Sleep Assessment Year 4

- See Table 2 for sample level descriptives of PSQI for all four years of the study.

#### Table 2.

*Means and Standard Deviations on the Pittsburgh Sleep Quality Index for Comparison*

<table>
<thead>
<tr>
<th>Component</th>
<th>Healthy Controls</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Sleep Quality</td>
<td>.40</td>
<td>1.06</td>
<td>1.08</td>
<td>0.95</td>
<td>0.88</td>
</tr>
<tr>
<td>Sleep Latency</td>
<td>.70</td>
<td>1.22</td>
<td>1.12</td>
<td>1.01</td>
<td>1.06</td>
</tr>
<tr>
<td>Sleep Duration</td>
<td>.31</td>
<td>0.59</td>
<td>0.51</td>
<td>0.50</td>
<td>0.20</td>
</tr>
<tr>
<td>Habitual Sleep Efficiency</td>
<td>.11</td>
<td>0.47</td>
<td>0.42</td>
<td>0.37</td>
<td>0.47</td>
</tr>
<tr>
<td>Sleep Disturbances</td>
<td>.95</td>
<td>1.20</td>
<td>1.11</td>
<td>1.16</td>
<td>1.05</td>
</tr>
<tr>
<td>Sleeping Medication</td>
<td>.12</td>
<td>0.31</td>
<td>0.30</td>
<td>0.42</td>
<td>0.27</td>
</tr>
<tr>
<td>Daytime Dysfunction</td>
<td>.44</td>
<td>1.75</td>
<td>1.52</td>
<td>1.57</td>
<td>1.17</td>
</tr>
<tr>
<td>PSQI Global Score</td>
<td>2.67 ± 1.70</td>
<td>6.64 ± 2.75</td>
<td>6.04 ± 3.12</td>
<td>5.95 ± 2.92</td>
<td>5.11 ± 2.36</td>
</tr>
</tbody>
</table>

*Note.* Adjusted means from Buysse et al., 1998. Higher scores indicate worse sleep. Interpretation for Global PSQI: Possible min: 0, Possible max: 21 and Sleep Sub Scales: Possible min 0, Possible max 3.

- Daytime sleepiness as measured by the ESS
ESS mean score: 9.75, 42% met criteria for excessive sleepiness (sum score >10)
  - Possible min: 0
  - Possible max: 24
  - Interpret higher score as more daytime sleepiness
- There were no significant improvements in daytime sleepiness from years previous.

- **Assessment of Sleep Knowledge**
  - Possible min: 0%
  - Possible max: 100%
  - Mean score: 48.5%
    - 0-50% (54.8%)
    - 60% (12.9%)
    - 70% (11.6%)
    - 80% (12.0%)
    - ≥90% (8.8%)
  - Sleep knowledge improved from Year 2 (M = 38.8%) to Year 4 (M = 48.5%), p=.000.
  - The SHAPE team conducted sleep education during Year 2 of the project. Accordingly, the majority of the 3rd and 4th year athletes attended the educational workshops. Knowledge appeared to be maintained from the educational talks, as the 1st and 2nd year students and 3rd and 4th year scored significantly higher on the sleep knowledge questionnaire than did lowerclasswo/men (p = .000).
    - \[ M_{\text{lower}} = 41.29 \ (SD = 23.6) \]
    - \[ M_{\text{upper}} = 57.25 \ (SD = 29.2) \]
  - Interestingly, sleep knowledge was not correlated with PSQI and ESS. This may mean that knowing more about sleep is not enough to translate to changes in sleep behaviors.
Summary of All-Conference Players

- N = 47 players (n = 32 females, 15 males) earned All-Conference honors during 2014-2015 season
- Comparison of Mental Health
  - All-conference players reported significantly fewer symptoms on the PDSQ, specifically:
    - Less Depression and Panic
    - No difference: PTSD, Agoraphobia, Alcohol, Drug, Somatization, Hypochondriasis, eating disorders, OCD, Social phobia, GAD, PDSQ total, Sum of PDSQ criteria
  - All-conference players reported significantly lower levels of perceived stress compared to non-honorees (M = 11.67 vs 15.27).
- Academic Performance
  - No difference observed for Fall 2014
  - No differences observed for cumulative GPA

Summary of Mental Health Service Use

- Participant Characteristics and Mental Health Service Use
  - To measure attitudes toward seeking professional psychological help, athletes were administered the Inventory of Attitudes Toward Seeking Mental Health Services (IASMHS)
    - Psychological openness measures how willing a person is to see psychological services as an option.
    - Help-seeking propensity is how likely a respondent is to actually seek out psychological services if they are needed.
    - Indifference to stigma measures how much the respondent would be concerned about “important others” knowing about their psychological service use (Mackenzie, Knox, Gekoski, & Macaulay, 2004).
    - Table 3 displays means and standard deviations on the IASMHS.
Table 3.  
*Means and Standard Deviations of Inventory of Attitudes Toward Seeking Mental Health Services in Student-Athletes*

<table>
<thead>
<tr>
<th>Categories</th>
<th>Mean and Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Openness</td>
<td>16.86 ± 6.33</td>
</tr>
<tr>
<td>Help-Seeking Propensity</td>
<td>20.08 ± 6.39</td>
</tr>
<tr>
<td>Indifference to Stigma</td>
<td>19.94 ± 5.98</td>
</tr>
<tr>
<td>Stigma Total</td>
<td>56.87 ± 12.72</td>
</tr>
</tbody>
</table>

*Note. Scores of subcategories can range from 0-32 for, 0-96 for Stigma Total, higher scores indicate more positive attitudes.*

- Female athletes reported more Psychological Openness, Help-Seeking Propensity, and less overall stigma than did male athletes. No differences were noted on the Indifference to Stigma subscale.
  - **Psychological Openness** (*p* = .04)
    - *Female M* = 17.6 (*SD* = 5.9)
    - *Male M* = 15.8 (*SD* = 6.8)
  - **Help-Seeking Propensity** (*p* = .005)
    - *Female M* = 21.1 (*SD* = 5.4)
    - *Male M* = 18.6 (*SD* = 7.3)
  - **Stigma Total** (*p* = .007)
    - *Female M* = 58.9 (*SD* = 13.1)
    - *Male M* = 54.0 (*SD* = 11.6)
  - The finding that female athletes reported more positive mental health attitudes was consistent with reported use of psychological services. Female athletes reported significantly more use of psychological services in the past 6 months than did male athletes (*t*(241) = 2.1, *p* = .004).
- No differences were noted between 1st and 2nd year students and 3rd and 4th year students on any of the IASMHS scales.
No differences were noted between ethnic or racial minority and non-ethnic or racial minority athletes on any of the IASMHS scales.

- **Mental Health Service Use**
  - Few athletes \( (n = 22, 9.1\%) \) reported that they had used a psychological service in the previous 6 months.
    - Among those athletes who reported use of a psychological service the majority used one type of service \( (M = 1.3, SD = .57) \).
    - Athletes indicated current use of individual therapy \( (n = 18, 7.4\%) \), psychotropic medication \( (n = 4, 1.6\%) \), and inpatient treatment \( (n = 1, <1\%) \).
  - Compared to Year 1 there was a significant improvement in attitudes of psychological stigma
    - Psychological Openness \( (t=-2.88(469), p=.004) \)
    - Indifference to Stigma \( (t=-2.41(446), p=.017) \)
    - Total Stigma \( (t=-2.62(489), p=.009) \)
    - No change was found in Help Seeking Propensity
  - A consistent potential barrier to mental health seeking is a lack of awareness of the support services offered on campus. As is displayed in Table 4, almost a third of the athletes \( (28.8\%) \) reported that they had never heard of the TU Counseling and Psychological Services Center.
Table 4.

*Percentage of Student-Athletes’ Awareness of Campus Resources Year 4*

<table>
<thead>
<tr>
<th>Resource</th>
<th>Never Heard of</th>
<th>Heard of</th>
<th>Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veteran’s Center</td>
<td>54.6%</td>
<td>44.5%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Alexander Health Center</td>
<td>9.6%</td>
<td>45.4%</td>
<td>45.0%</td>
</tr>
<tr>
<td>TU Safe Zone</td>
<td>40.8%</td>
<td>58.8%</td>
<td>0.4%</td>
</tr>
<tr>
<td>International Center Services</td>
<td>28.8%</td>
<td>64.4%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Counseling and Psychological Services Center</td>
<td>28.5%</td>
<td>64.4%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Alcohol Education</td>
<td>27.3%</td>
<td>68.1%</td>
<td>4.6%</td>
</tr>
<tr>
<td>United Campus Ministry</td>
<td>23.9%</td>
<td>71.8%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Career Services</td>
<td>10.9%</td>
<td>77.4%</td>
<td>11.7%</td>
</tr>
<tr>
<td>Center for Student Academic Support (CSAS)</td>
<td>8.4%</td>
<td>77.4%</td>
<td>14.2%</td>
</tr>
</tbody>
</table>