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

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

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Special Mention

We extend our gratitude to the following SHAPE members. Emily Kaier conducted data collection and analysis as well as authoring this paper under the guidance of Dr. Lisa Cromer. To Dr. Joanne L. Davis and Kathleen Strunk for offering input throughout the development of this report as well as their considerable contributions to the review and editing process.
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**Introduction**

During the 2011-2012 academic year, The University of Tulsa Institute of Trauma, Adversity and Injustice (TITAN) conducted a mental health services needs assessment of the University’s student-athletes. Results of this assessment provided a baseline for an on-going longitudinal study under the Student Health, Athletic Performance, and Education (SHAPE) project. SHAPE's goal is to improve University of Tulsa (TU) athletes' academic and athletic performance by addressing the interplay of health and stress on functioning.

The following document presents relevant information from literature reviews, key findings from the third year of the project, and recommendations for future interventions. For a brief overview of the main activities of SHAPE to date, see Table 1 below.

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Academic Year</th>
<th>Summary of Main Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>2011-2012</td>
<td>✓ First mental health needs assessment with student athletes</td>
</tr>
</tbody>
</table>
| Year 2     | 2012-2013     | ✓ Second mental health needs assessment with student athletes  
|           |               | ✓ Two Sleep Workshops with each team |
| Year 3     | 2013-2014     | ✓ Third mental health needs assessment with student athletes  
|           |               | ✓ SHAPE integration into Hurricane Athletes Achieving Success (HAAS) programming (Time Management and Sleep Workshops)  
|           |               | ✓ Individual team consultation  
|           |               | ✓ Collaboration with TU Counseling and Psychological Services Center |
**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 education and intervention planning for Year 2: daytime dysfunction due to sleepiness 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, in response to feedback from coaches and athletic training staff, a measure of mental toughness was added to the assessment battery in order to gauge whether or not athletes may benefit from mental toughness training.
Athletes

Data collection was organized in consultation with coaches and athletic training staff and occurred either during teams’ weight training sessions or 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 participation. Athletes who chose to participate (N = 245) signed an informed consent and indicated if researchers had permission to access their academic record through the athletics department. The majority of athletes participating in Year 3 (n = 201, 84%) gave permission for researchers to access their academic records. Given that the SHAPE project collected data longitudinally, we also calculated the percentage of participants from Year 3 that participated in other years of the project. The majority of athletes from Year 3 participated in Year 3 of the research only (See Table 2).

Table 2.
Summary of Longitudinal SHAPE participants (N = 245)

<table>
<thead>
<tr>
<th>Participation Years</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 3 only</td>
<td>130 (53%)</td>
</tr>
<tr>
<td>Year 2 &amp; 3</td>
<td>73 (30%)</td>
</tr>
<tr>
<td>Year 1-3</td>
<td>42 (17%)</td>
</tr>
</tbody>
</table>

Each year of the SHAPE project, after the data collection session was completed, a graduate assistant (GA) reviewed athletes’ medical charts that were on file in the athletic training room. Indicators of psychological and medical service use as well as health status (e.g., clinic visits, weight, medication use) were recorded for analyses, along with the electronically generated list of injuries from the training room database. The athletic department also provided
Fall 2013 GPAs and the cumulative GPA for athletes who had consented to their data being released for the study.

**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 3 of the project, non-athletes ($N = 122$) 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 survey system. Non-athletes were able to log onto the system at any time during the semester and complete the questionnaires at a computer of their choosing.

**Demographics**

A total of 245 student-athletes volunteered to participate SHAPE research in Year 3 (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 (45.5%) and female (55.5%) athletes participated. Almost all of the participants reported their marital status as single (98%), and one-third (32.1%) reported having

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**Figure 1. Reported Race**

- Caucasian or White: 77%
- African American or Black: 13%
- Asian: 1%
- American Indian: 1%
- Pacific Islander: 2%
- Unknown: 1%
- Multiracial: 5%

**Figure 2. Year in School**

- Freshman: 39%
- Sophomore: 27%
- Junior: 17%
- Senior: 13%
- Fifth year/Grad student: 4%
a boyfriend or girlfriend. Participants’ self-reported ethnicity and year in school are displayed in Figures 1 and 2.

Similar to athletes, non-athletes were approximately 20 years of age ($M = 20.5, SD = 1.7$) and reported similar racial diversity as the SHAPE athletes (68% Caucasian). In contrast to the athlete sample, the non-athlete sample was primarily female (81%). Data collection, time of day, week of the semester, as well as 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 who were also selected to an all-conference team (All-Conference USA) during the 2013-2014 athletic seasons were identified through the Conference USA website. Specifically, TU athletes who received any level of all-conference honors (e.g., first team, second team, all-freshman) were noted by researchers and grouped in analyses. From the website it was determined that 54 athletes at TU earned all-conference honors during Year 3. Of those athletes that earned honors, about half (51%, $n = 28$) were SHAPE participants during Year 3. Among the SHAPE participants, more all-conference athletes were female (64%) than male (36%). All-conference honorees were similar in age ($M = 20.0, SD = 1.4$) and were equally likely to report being a racial or ethnic or minority status as compared to those TU athletes 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 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 psychological disorders commonly encountered in primary care. The PDSQ has been shown to have good sensitivity for 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 a 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 a 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
Mental Toughness

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. For example, a mentally tough athlete perceives competing against a better ranked team as an opportunity for improvement instead of the threat of embarrassment or loss. *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. For example, when there is a loud crowd at a competition, a mentally tough athlete understands that while they cannot control the crowd, they can control their own response to the crowd. *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. For example, choosing to pace studying over the semester, so that all-nighters do not negatively influence weight training sessions. 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). For instance, a mentally tough athlete knows and has confidence in his or her own strengths and capacity to deliver.

Overall, TU athletes reported moderate ranges of MT on each of the four subcomponents (See Table 3). There were neither gender differences nor grade level differences noted for any of the subcomponents of MT. Differences were noted when athletes were compared by ethnicity. Caucasian athletes reported significantly higher levels of MT on all four components of MT. Finally, when compared to the non-athlete sample, athletes reported significantly higher levels on all four subcomponents of MT (See Table 3).

**Mental Toughness and Academic Performance**

As a whole, athletes’ Fall 2013 GPAs were significantly correlated with the commitment ($r = .22, p = .00$) and control ($r = .17, p = .02$) subcomponents of MT such that higher Fall GPAs were associated with more commitment and more control. In other words, athletes who were able to put aside distractions or temptations in the long term and who believed in their ability to influence a given situation were more likely to earn higher GPAs. Fall 2013 GPAs were not correlated with challenge or confidence. Not surprisingly, these correlations suggest that athletes who think of themselves as persistent and believe they can make a difference in their own environment earn higher GPAs.

**Mental Toughness and Athletic Performance**

All-conference athletes reported higher levels of two components of MT: challenge and control. All-conference athletes’ reported challenge scores were significantly higher ($M = 30.3$) than that of non-all conference athletes ($M = 27.8, t(217) = -2.69, p = .00$). This finding indicates that all-conference athletes reportedly perceive challenges as opportunities instead of threats. In addition, all-conference athletes reported significantly higher levels of control ($M = 45.6$) than
did non all-conference athletes, $M = 43.3$, $t(217) = -1.94$, $p = .03$. These differences may mean that all-conference athletes more strongly believe that they have influence over their own environment.

Athletes’ responses indicated no differences on the commitment and confidence subscales based on all-conference status. The lack of differences in these subscales may mean that all athletes were similarly confident as well as committed, keeping focused on their goals.

Taken together, the differences in MT subscales suggest that while most TU athletes were equally persistent, committed and confident, the best performing athletes saw challenges as opportunities and believed they have more control over their environment.

Table 3.

*Means and Standard Deviations of Mental Toughness Subcomponents by Athlete Status*

<table>
<thead>
<tr>
<th>Athlete Status</th>
<th>Control</th>
<th>Commitment</th>
<th>Confidence</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non All-C-USA Athlete ($N = 192$)</td>
<td>43.3 (5.8)</td>
<td>39.4 (5.8)</td>
<td>51.9 (7.5)</td>
<td>27.8 (4.5)</td>
</tr>
<tr>
<td>All-C-USA Athlete ($N = 27$)</td>
<td>45.6 (5.6)</td>
<td>40.4 (4.2)</td>
<td>52.2 (7.5)</td>
<td>30.3 (4.1)</td>
</tr>
<tr>
<td>Non-athlete ($N = 122$)</td>
<td>35.5 (7.0)</td>
<td>28.4 (4.7)</td>
<td>39.6 (9.7)</td>
<td>20.7 (4.8)</td>
</tr>
</tbody>
</table>

*Note.* Mean (Standard Deviation). Higher Scores indicate more mental toughness. Score ranges 13 to 65 for control, 11-55 for commitment, 15-75 for confidence, and 8-40 for challenge.

**Key findings on Mental Toughness**

- Athletes reported significantly higher levels of all subcomponents of MT than did non-athletes.
- All-conference athletes reported higher scores on the challenge and control subscales of MT indicating that they may be more likely to perceive challenges as opportunity instead of threats and more strongly believe that they have influence over their own environment.
Fall 2013 GPAs were significantly correlated with the commitment and control subcomponents of MT such that higher Fall GPAs were associated with more commitment and control.

There were no differences based on all-conference status on reported levels of commitment and confidence.

There were no gender or age differences observed among athletes on MT subcomponents.

**Mental Health Profile**

**Mental Health Screening Results**

In order for the SHAPE researchers to assess the mental health profile of SHAPE athletes, participants completed the PDSQ. The PDSQ screens for 14 of the most common clinical disorders encountered in clinical practice as outlined by the revised 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000). Prevalence rates of positive screens on the PDSQ for athletes during Years 1 through 3 of the study are shown in Figures 3-6. In general, SHAPE athletes reported similar prevalence of symptoms in the 3 years. When explored by gender, similar to epidemiological research, female athletes reported more mental health symptoms than male athletes with one exception. Male athletes reported more drug use than did female athletes, although the rate of overall drug use was very low (< 5% of athletes). Finally, similar to previous years of the SHAPE project, TU athletes reported significantly fewer symptoms than the non-athletes on all subscales of the PDSQ.
Figure 3. Proportion of Female Athletes Who Screened Positive for Psychopathology

Figure 4. Proportion of Male Athletes Who Screened Positive for Psychopathology
Figure 5. Proportion of Female Athletes Who Screened Positive for Psychopathology

Figure 6. Proportion of Male Athletes Who Screened Positive for Psychopathology
Stress

PSS scores can range from 0 to 40, with higher scores indicating more stress. On a measure of current perceived stress (PSS), athletes reported moderate levels of stress ($M = 16.89, SD = 6.4$). Athletes reported less stress than non-athletes ($M = 18.09, SD = 7.3$), although these differences did not meet the threshold for statistical significance ($p = .12$). In contrast to previous years of the study, no differences in perceived stress were observed by athlete gender or ethnicity. First and second year athletes reported significantly more stress than the older student athletes ($M = 17.5$ versus $M = 14.6$, $t(233) = 2.17$, $p = .03$).

Athletic Stress

On the CSALSS, a measure of athlete life stress, athletes reported relatively low levels of life stress ($M = 26.74, SD = 16.75$) as scores can range from 0 to 120. Table 4 displays sample items of the CSALSS subscales. On the subscales of the CSALSS athletes indicated the most amount of stress from performance demand ($M = 4.55$), sports injury ($M = 4.40$) and academic requirements ($M = 4.10$). Athletes indicated the least amount of stress from romantic relationships ($M = 2.20$), interpersonal relationships ($M = 2.21$) and family relationships ($M = 2.76$).

Male and female athletes reported differences in the magnitude of athletic stressors. In general, female athletes reported more athletic stress ($M = 29.71, SD = 16.2$) than did male athletes ($M = 22.62, SD = 16.9$, $t(225) = 3.19$, $p = .002$). Furthermore, when we explored athletic stress by subscales, female athletes also reported significantly more stress about academic requirements, training adaptation, coaching relationships, and performance demand than did males. No differences were noted between genders on the remaining subscales (i.e., romantic relationships, family relationships, interpersonal relationships, and sports injury).
Table 4.

Description of Athletic Stress Measure Subcomponents

<table>
<thead>
<tr>
<th>Subcomponent</th>
<th>Sample Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sports Injury</td>
<td>• I worry about being frequently injured.</td>
</tr>
<tr>
<td></td>
<td>• I am annoyed by my injury because it has still not yet fully recovered.</td>
</tr>
<tr>
<td>Performance Demand</td>
<td>• I worry about my unstable competitive performance.</td>
</tr>
<tr>
<td></td>
<td>• I am afraid of being eliminated from competition because of poor performance.</td>
</tr>
<tr>
<td>Coaching Relationships</td>
<td>• I am annoyed by my coach’s preference for some teammates.</td>
</tr>
<tr>
<td></td>
<td>• I am annoyed by my coach’s bias against me.</td>
</tr>
<tr>
<td>Training Adaptations</td>
<td>• I worry that my training is not beneficial to my performance.</td>
</tr>
<tr>
<td></td>
<td>• I am annoyed with the training program now.</td>
</tr>
<tr>
<td>Interpersonal Relationships</td>
<td>• I am annoyed with being friendless.</td>
</tr>
<tr>
<td></td>
<td>• I am annoyed by my social skills because it seems like nobody likes me.</td>
</tr>
<tr>
<td>Romantic Relationships</td>
<td>• I am annoyed with not getting along with my romantic partner.</td>
</tr>
<tr>
<td></td>
<td>• I am annoyed with not finding time to encounter romantic partners.</td>
</tr>
<tr>
<td>Family Relationships</td>
<td>• I am bothered by difficult situations in my family.</td>
</tr>
<tr>
<td></td>
<td>• I am annoyed with communicating with my family.</td>
</tr>
<tr>
<td>Academic Requirements</td>
<td>• I am annoyed when preparing for exams.</td>
</tr>
<tr>
<td></td>
<td>• I worry about my academic skills because I do not know how to learn efficiently.</td>
</tr>
</tbody>
</table>

Note. Taken directly from original measure article Lu et al 2012

**Stress and Academic Performance**

As a whole, athletes performed well academically during the Fall 2013 academic semester (\(M_{GPA}= 3.14, \ SD = .75\)). Fourteen percent of SHAPE athletes earned 4.0s during the Fall 2013 academic semester (\(n= 28\)). In contrast to previous years of the project, athletes’ current perceived stress was not associated with GPA. However, the academic requirements subscale of the CSALSS was correlated with GPA such that athletes with lower GPAs reported
more academic stress than those with higher GPAs ($r = -.210, p = .003$). This supports the idea that athletes who are challenged academically to maintain acceptable GPAs experience more stress than those who are performing better academically.

**Stress and Athletic Performance**

Being injured during the Fall 2013 semester was positively associated with sports injury stress on the CSALSS ($r = .208, p = .002$) such that athletes who were injured reported more stress. No differences were observed in total athletic stressors on the CSALSS based on all-conference status. Interestingly, all-conference athletes reported significantly less current stress on the PSS than did non-all conference athletes ($M = 14.6, SD = 5.5$, versus $M = 17.2, SD = 6.5$, respectfully, $t(224) = 2.02, p = .04$). This indicates that all-conference athletes experience similar levels of stress related to athletic participation but may be better at handling general life stress.

**Mental Toughness as Resilience to Stress**

Among athletes, MT appeared to act as a potential buffer to stress; several of the stress variables were negatively related to MT. For instance, each of the MT components were negatively correlated with the number of positive mental health domains that were screened on the PDSQ (i.e., confidence, $r = -.28, p < .001$; commitment, $r = -.21, p < .001$; control ($r = -.41, < .001$; challenge, $r = -.12, p = .10$). In addition, MT negatively correlated with general life stress (i.e., PSS) as well as to early adversity (i.e., ACEs). These negative correlations may mean that the more MT athletes report, the less likely they are to report experiencing mental health concerns and that facilitating mental toughness among athletes may help to reduce mental health symptoms and stress. Conversely, it may be that mental health issues that are not addressed may erode athletes’ mentally toughness, and make them less able to effectively buffer psychological
challenges of their sports. However, these results must be interpreted with caution given that they are correlational and therefore not causal.

Key findings on Stress

- Athletes with lower GPAs reported more academic stress than those with higher GPAs.
- Injury during the Fall 2013 semester was positively associated with self-reported athletic stress such that athletes who were injured reported more stress than those who were not.
- All-conference athletes reported similar levels of athletic stress but lower levels of life stress than did non-all conference athletes.
- Mental toughness was related to mental health such that athletes higher in MT were less likely to report experiencing mental health concerns.

Sleep

The average global sleep score for all SHAPE athletes was 5.95 ($SD = 2.92$). On this scale, higher numbers indicate worse quality sleep. The SHAPE average exceeds 5 which is typically considered the cut-off distinguishing good and poor sleep quality (Buysse et al., 1989). Indeed, 70% of athletes exceeded the cut-off of 5 ($n = 152$). No ethnicity or age differences emerged. Female athletes reported significantly worse sleep scores ($M = 6.3$) than did male athletes ($M = 5.4$, $t (214) = 2.1, p = .03$). Athletes did report better overall sleep quality than non-athletes ($M = 5.95$ versus $M = 7.39$, $t (299.3) = 5.0, p < .001$) however when compared to healthy controls (in the published literature), all SHAPE athletes reported worse scores on each sleep subscale on the PSQI (see Table 5). These high scores further indicate the relatively poor sleep quality among athletes.
On the ESS, a measure of daytime sleepiness, athletes reported an average score of 9.8 (SD = 4.7). More than half of athletes reported a score above 8 (59.8%, n = 143), which is generally considered a level of sleepiness necessary for clinical intervention (Rosenthal & Dolan, 2008). Further exploration into demographic differences revealed that female athletes reported similar levels of sleepiness as male athletes. However, first and second year athletes reported significantly more sleepiness than did older athletes (M = 10.3 versus M = 8.8, t(238) = 2.31, p = .022). Athletes reported significantly more daytime sleepiness (M = 8.71, SD = 3.83 compared to non-athletes M = 9.80, SD = 4.66), t(288) = -2.38, p = .018).

### Sleep and Academic Performance

Interestingly, several self-reported measures of sleep were associated with Fall 2013 GPA including: sleep quality (r = -.16, p = .033), sleep duration (r = -.15, p = .04), the PSQI global score (r = -.15, p = .041) and sleepiness (r = -.17, p = .017). These correlations may mean that poorer self-reported sleep quality, shorter sleep duration, daytime sleepiness, and poorer overall sleep quality are related to worse Fall 2013 GPAs. As these data are cross-sectional, it is impossible to determine the direction of this finding.

<table>
<thead>
<tr>
<th>Component</th>
<th>Healthy Controls</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Sleep Quality</td>
<td>1.92</td>
<td>1.06</td>
<td>1.08</td>
<td>0.95</td>
</tr>
<tr>
<td>Sleep Latency</td>
<td>1.96</td>
<td>1.22</td>
<td>1.12</td>
<td>1.01</td>
</tr>
<tr>
<td>Sleep Duration</td>
<td>1.74</td>
<td>0.59</td>
<td>0.51</td>
<td>0.50</td>
</tr>
<tr>
<td>Habitual Sleep Efficiency</td>
<td>1.63</td>
<td>0.47</td>
<td>0.42</td>
<td>0.37</td>
</tr>
<tr>
<td>Sleep Disturbances</td>
<td>1.45</td>
<td>1.20</td>
<td>1.11</td>
<td>1.16</td>
</tr>
<tr>
<td>Sleeping Medication</td>
<td>0.08</td>
<td>0.31</td>
<td>0.30</td>
<td>0.42</td>
</tr>
<tr>
<td>Daytime Dysfunction</td>
<td>1.83</td>
<td>1.75</td>
<td>1.52</td>
<td>1.57</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>
</tr>
</tbody>
</table>

Note. Adjusted means from Buysse et al., 1998. Higher scores indicate worse sleep. Global score: M ± SD
Sleep and Athletic Performance

In the current year of the study there were few sleep variables related to measured indices of performance. In Year 2 of the study, all-conference athletes reported significantly better sleep habits and less daytime sleepiness than did non-all conference athletes. In the current year no statistically significant differences were observed between all-conference and non all-conference athletes. However, fewer all-conference athletes participated in the current year of data collection (n = 28), and so a smaller sample may have made differences between the groups harder to statistically detect. There was no observed relationship between sleep and any of the injury variables.

Key findings on Sleep

- More than two-thirds (70%) of the SHAPE athletes reported experiencing some level of sleep dysfunction.
- Half of athletes reported daytime sleepiness scores at the level necessary for clinical intervention.
- First and second year athletes reported significantly more sleepiness than athletes in their third year and beyond.
- Compared to the non-athlete comparison sample, athletes reported significantly more daytime sleepiness.
- Several self-reported measures of sleep were associated with GPA including sleep quality, sleep duration, the PSQI global score and sleepiness.
  - These correlations may mean that poorer self-reported sleep quality, shorter sleep duration, and poorer overall sleep quality are related to worse GPAs.
- In Year 3 of the project there were no observed relationships between sleep and athletic performance variables.
SHAPE Interventions

SHAPE & HAAS

In the beginning of Year 3 the SHAPE team met with the Associate Athletic Director (AD) for Student-Athlete Development and the AD for Student Services. Collaboratively it was decided that the Hurricane Athletes Achieving Success (HAAS) program would be an ideal platform for the SHAPE team to convey information to the newest group of athletes each year. Additionally, we discussed that the Hurricane Academic Services (HAS) Lunch and Learn program would be an appropriate venue to disseminate SHAPE information to athletes of all ages. In Year 3 it was agreed that SHAPE would conduct workshops at two HAAS events in the Fall and two Lunch and Learns in the Spring.

Improve Time and Stress Management Skills. In Year 2 of the SHAPE project, athletes’ responses to the survey indicated that stress was a major obstacle to academic success. Accordingly, during Year 3 of the project the SHAPE team developed a stress and time management workshop. The workshop, Scheduling Success, was delivered through HAAS as well as the Spring Lunch and Learn program. Workshops were well attended and athletes anecdotally reported enjoying the information and interactive aspects of the workshops.

The Scheduling Success workshop was comprised of education about time management strategies including important factors to consider when planning one’s schedule (e.g., best time of day to study). During the course of the workshop, athletes were able to use large Velcro scheduling boards to plan a typical week schedule using their own time commitments (e.g., practice, class, and weight times). Workshop facilitators encouraged athletes to consider relevant information from the workshop to make the most of their schedule. For example, athletes were
prompted to consider the optimal times for studying based on science related to memory consolidation and interference research when planning their study schedules.

**Power of Sleep Workshop.** In Year 2 of the project, because survey responses indicated that athletes on average were poor sleepers, two different research-informed workshops were developed. We incorporated feedback from athlete focus groups in designing the workshops. Broadly, both 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. Based on feedback from the athletics department in Year 3 of the project, these two workshops were consolidated into a single workshop. Athletes learned about the impact of sleep on health, injury prevention, and recovery from injury as well as recent research relevant to sleep and athletic and academic performance. Workshop facilitators were also available to answer any questions that athletes have about their current sleep habits and help problem solve possible solutions.

**Key findings on SHAPE and HAAS**

- SHAPE and Hurricane Academic Services Staff decided that Hurricane Athletes Achieving Success (HAAS) program would be an ideal platform for the SHAPE team to convey information to the newest group of student athletes.
  - Additionally, we discussed that in the Hurricane Academic Services’ Lunch and Learns would be an appropriate avenue to disseminate SHAPE information
- Two topics were presented by the SHAPE team to athletes: stress and time management, the importance of sleep.
SHAPE and Counseling Services

Incorporating a co-located mental health professional into the TU athletic department has been an aspirational goal from the beginning of the SHAPE project. Every year of data collection has supported the idea that TU athletes may underutilize psychological services. In Year 3 of the project, collaborative meetings with members of TU Counseling and Psychological Services, HAAS, and the SHAPE team were held in order to brainstorm how to best design a co-located service. The literature on athletic department service delivery models was reviewed (e.g., Leffingwell, 2001) and important considerations were discussed including: location of services, type of services, confidentiality and who could deliver the services.

Starting in the Spring of 2014, Dr. Michael McClendon, a staff psychologist at TU Counseling and Psychological Services, began scheduling hours in the TU training room. Dr. McClendon provided what was termed “Campus Coaching.” This service was designed to be a way to facilitate support service utilization including therapy services on campus. For example, athletes could choose to see Dr. McClendon in the training room if they were having trouble with anxiety and needed to know about available psychological services. Dr. McClendon could provide a description of what therapy would be like and help athletes schedule appointments in the Counseling Center. Campus Coaching also included suggestions for other helpful resources both online and on campus (e.g., CSAS). Our hope is that Campus Coaching will help break down barriers to mental health care by allowing athletes an introduction to services.

Psychological Services on Campus

Mental Health Stigma. Overall, SHAPE athletes reported relatively neutral attitudes ($M = 55.9, SD = 13.1$) toward psychological services. Also of note is that the current sample reported more positive attitudes than the sample of athletes from Year 1 of the project ($M = \ldots$)
53.6). However, Year 3’s average score was still significantly lower than non-athletes who tended to have more positive attitudes about psychological services ($M = 64.5, SD = 14.5$). Additionally, on the measure of help-seeking, athletes reported an average overall score of 19.9 ($SD = 6.2$), which was lower than non-athletes ($M = 23.1, SD = 6.0$) indicating a lower help-seeking propensity. Athletes also demonstrated more negative attitudes on measures of indifference to stigma ($M = 19.6$ versus $M = 21.6$) and psychological openness ($M = 16.5$ versus $M = 19.7$).

It is important to note that the comparison sample of non-athletes is comprised mostly of students who were enrolled in a psychology class. Research shows that psychology students may hold more positive mental health attitudes than do non-psychology students given that education on mental illness has been shown to reduce mental health stigma (Rüscher, Angermeyer, & Corrigan, 2005). While the current year of athletes reported less positive attitudes than non-athletes, as is displayed in Table 6, over the past three years athletes’ attitudes have become increasingly more positive. While we are unable to directly measure or know the many reasons

Table 6.
Means and Standard Deviations of Inventory of Attitudes Toward Seeking Mental Health Services in Student-Athletes at Two Time Points

<table>
<thead>
<tr>
<th>Categories</th>
<th>Year 1 M (SD)</th>
<th>Year 3 M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Openness</td>
<td>16.2</td>
<td>16.5</td>
</tr>
<tr>
<td>Help-Seeking Propensity</td>
<td>18.8</td>
<td>19.9</td>
</tr>
<tr>
<td>Indifference to Stigma</td>
<td>18.6</td>
<td>19.6</td>
</tr>
<tr>
<td>Stigma Total</td>
<td>53.6</td>
<td>56.0</td>
</tr>
</tbody>
</table>

Note. Scores of subcategories can range from 0-3, 0-96 for Stigma Total, higher scores indicate more positive attitudes.
for increasingly positive mental health attitudes, it is our hope that the SHAPE project has played a role in attitude improvements.

Psychological service utilization data was obtained from three sources: self-report, TU Counseling and Psychological Services Center records, and the TU athletic training room records. First, athletes were asked to report their current (i.e., past 6 months) and lifetime use of psychological services. Few athletes ($N = 32, 15.8\%$) reported that they had used a psychological service in the previous 6 months (See Table 7). Among those athletes who reported use of a psychological service, the majority of athletes were using one type of service ($M = 1.3, SD = .6$). Athletes indicated current use of individual therapy ($n = 24, 9.7\%$), group counseling ($n = 2, .8\%$) and psychotropic medication ($n = 19, 7.7\%$). The percentage of athletes reporting current use of a psychological service had more than doubled in the past three years of the project (see Table 7), suggesting that there may be an increase in awareness of campus services, or reduction in stigma about help-seeking.

Second, psychological service utilization was also measured directly from anonymized data from TU Counseling Center records. During the Fall 2013 semester, a total of 24 visits were made by student athletes to the TU Counseling Center resulting in an average of 4.8 athlete visits per month. During the same time period, 471 visits were made to the TU Counseling Center by non-athletes. This means that athletes comprised 5\% of the total visits made to the Counseling Center by TU students during the Fall 2013 semester. Since athletes represent approximately 10\% of the student population this provides evidence that athletes may have utilized psychological services at lower frequency than non-athletes.

Similar to Year 1 of the project, while it appeared that athletes were psychologically healthier than non-athletes and therefore had less need for psychological services, only 16\% of
athletes reported using psychological services compared to the 48% of athletes that screened positive for at least one psychological disorder on the PDSQ. There may be a variety of reasons for athletes’ underutilization of psychological services. One explanation for underutilization could simply be a lack of awareness of services offered on campus. For example, in Year 1 only half of athletes (49.3%) reported that they had heard of the Counseling and Psychological Services Center with only 6% reporting using the service. These utilization rates were proportionally less than their non-athlete counterparts. The majority of non-athletes (90%) reported that they had heard of the Counseling and Psychological Services Center and almost twice as many reported using the service (12%). Encouragingly, awareness of the Counseling and Psychological Services Center among athletes increased to 54.7% this year.

Table 7.

<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>67.8%</td>
<td>31.8%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Alexander Health Center</td>
<td>6.1%</td>
<td>40.4%</td>
<td>53.5%</td>
</tr>
<tr>
<td>TU Safe Zone</td>
<td>50.6%</td>
<td>49.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>International Center Services</td>
<td>40.5%</td>
<td>50.8%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Counseling and Psychological Services Center</td>
<td>35.8%</td>
<td>54.7%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Alcohol Education</td>
<td>39.8%</td>
<td>56.0%</td>
<td>4.1%</td>
</tr>
<tr>
<td>United Campus Ministry</td>
<td>30.6%</td>
<td>67.8%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Career Services</td>
<td>8.7%</td>
<td>75.5%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Center for Student Academic Support (CSAS)</td>
<td>7.9%</td>
<td>76.8%</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

Finally, psychological service use was measured within the athletic department records. During the Fall 2013 semester, there was one documented electronic referral and seven
additional referrals made by the training room staff to the Counseling Center for psychological services. It is important to note that referrals to the Counseling Center were not systematically documented, so the actual number of referrals may be higher. In addition, 21 athletes had psychotropic medicine documented in their athletic department chart. This means that the number of athletes with psychotropic medications in their charts had almost doubled from Year 2 \((n = 12)\). The majority of these medications were prescribed for problems with attention \((n = 8)\) while the rest were prescribed for mood or anxiety.

**Key findings on Psychological Service Usage**

- More positive attitudes were reported in Year 3 of the project compared to Year 1. Athletes reported relatively neutral attitudes about mental health stigma and help seeking.
- A small proportion of athletes self-reported using psychological services in the past 6 months.
- Many athletes reported being unaware of available resources on campus, which may have contributed to lower utilization.
  - Encouragingly, the percent of athletes reporting that they have heard of and used the Counseling and Psychological Services Center had increased from Year 1 of the project.
- Possible barriers to receiving psychological services may also have included negative attitudes about seeking mental health treatment such as stigma, or appearing “weak.” This had yet to be empirically determined.
- The amount of psychotropic medication utilization almost doubled from the previous year of the study.
Recommendations

Goal: Continue to Improve Time and Stress Management Skills

- Who: open to all student athletes and those athletes referred by HAAS.
- Continue to deliver an interactive workshop discussing the basics of time management skills to be delivered through HAAS.

Goal: Continue to Improve Sleep Through Education and Awareness.

- Who: open to all student athletes and those athletes referred by HAAS.
- Continue to deliver the Sleep Workshop to all student athletes for general health benefits.

Goal: Increase Psychological Service Utilization Through Co-located Psychological Consultation Services.

- Educate athletes about the types of services, the benefits of services, and their access to free services on campus.
- Continue to provide Campus Coaching through the TU athletic department.

Goal: Improve Mental Toughness Skills.

- Develop a Mental Toughness workshop.
- Educate athletes on a team-to-team basis about Mental Toughness including strategies to improve athletic performance.
References


