A COMPARISON OF HARDINESS AND QUALITY OF LIFE BETWEEN STUDENT-ATHLETES AND NON-ATHLETES

by

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGEMENTS</th>
<th>vi</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>LIST OF ABBREVIATIONS</td>
<td>ix</td>
</tr>
</tbody>
</table>

## CHAPTER

### I. INTRODUCTION

- Background and Significance .................................................. 1
- Operational Definitions ......................................................... 2
- Delimitations ........................................................................... 3
- Assumptions ............................................................................. 3
- Limitations .............................................................................. 3
- Statement of the Problem ....................................................... 4
- Research Hypothesis ............................................................... 4
- Independent Variable ............................................................. 5
- Dependent Variable ............................................................... 5
- Specific Aims .......................................................................... 5

### II. LITERATURE REVIEW

- Hardiness .................................................................................. 6
  - Hardy behaviors ..................................................................... 7
- Development ............................................................................. 9
- Measurement ............................................................................ 12
- Importance .............................................................................. 14
- Quality of Life ......................................................................... 14
  - Measurement ....................................................................... 15
- Value of Quality of Life .......................................................... 17
- Psychological Variability across Sports ................................... 18
- Statement of the Problem ....................................................... 19
- Specific Aims .......................................................................... 19
III. METHODS .................................................................................................................................20

Design ...........................................................................................................................................20
Participants....................................................................................................................................20
Instruments....................................................................................................................................20
Demographic Questionnaire ..........................................................................................................20
Dispositional Resilience Scale-15 .................................................................................................21
World Health Organization Quality of Life Assessment-BREF ..................................................21
Study Procedures ..........................................................................................................................22
Data Analysis ..................................................................................................................................23

IV. MANUSCRIPT .............................................................................................................................24

Introduction .....................................................................................................................................24
Methods ..........................................................................................................................................25
Study Design ....................................................................................................................................25
Participants .......................................................................................................................................26
Instruments .......................................................................................................................................27
Procedures .......................................................................................................................................28
Data Analysis ....................................................................................................................................28
Results ............................................................................................................................................29
Discussion .........................................................................................................................................33
Limitations .........................................................................................................................................35
Conclusion ..........................................................................................................................................36
References ..........................................................................................................................................37

APPENDIX SECTION ........................................................................................................................40

REFERENCES .......................................................................................................................................50
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demographic Characteristics of Participants</td>
<td>30</td>
</tr>
<tr>
<td>2. Primary Sport Frequency of Athletes</td>
<td>30</td>
</tr>
<tr>
<td>3. Hardiness Component and Quality of Life Scores in Comparison Groups (Mean±SD)</td>
<td>31</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Correlation of Quality of Life scores with commitment scores of collegiate athletes and non-athletes</td>
<td>32</td>
</tr>
<tr>
<td>2. Correlation of Quality of Life scores with control scores of collegiate athletes and non-athletes</td>
<td>32</td>
</tr>
</tbody>
</table>
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRS-15</td>
<td>Dispositional Resilience Scale-15</td>
</tr>
<tr>
<td>QoL</td>
<td>Quality of life</td>
</tr>
<tr>
<td>WHOQOL-BREF</td>
<td>World Health Organization Quality of Life Scale BREF</td>
</tr>
<tr>
<td>HS</td>
<td>Hardiness Scale</td>
</tr>
<tr>
<td>PVS III-R</td>
<td>Personal Views Survey III-Revised</td>
</tr>
<tr>
<td>HRQoL</td>
<td>Health-related quality of life</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>ComQoL</td>
<td>Comprehensive Quality of Life Scale</td>
</tr>
<tr>
<td>WHOQOL-100</td>
<td>World Health Organization Quality of Life Scale-100</td>
</tr>
<tr>
<td>AQoL</td>
<td>Assessment of Quality of Life</td>
</tr>
<tr>
<td>QOLI</td>
<td>Quality of Life Inventory</td>
</tr>
<tr>
<td>SWLS</td>
<td>Satisfaction with Life Scale</td>
</tr>
<tr>
<td>ANOVA</td>
<td>Analysis of variance</td>
</tr>
</tbody>
</table>
I. INTRODUCTION

Background and Significance

Hardiness is a personality trait that enables individuals to handle difficult situations. It does not decrease stress from challenges, but an individual with high hardiness is equipped with strategies and behaviors that moderate the stress response. Hardy behaviors include problem-focused coping, supportive social interactions, and beneficial self-care. This personality variable sets hardy people apart by enabling them to withstand a stressful situation without experiencing the negative effects typical of those with low hardiness. In fact, hardiness has been shown to moderate the effects of negative life events on injury occurrence in an athletic population. Hardy people are able to reframe the negative situation to determine how they could benefit from the experience.

Hardiness has 3 components: commitment, control, and challenge. Commitment helps one stay connected with situations instead of disengaging when it gets difficult. Control helps one believe that they can influence the situations they are faced with. Challenge helps one realize that difficulty is unavoidable and presents an opportunity for improvement. All of these 3 components are necessary to have hardiness.

Hardiness has been found to be related to improved mental health. This shows that hardiness is an important skill for well-being. Resilience, a related construct, has shown a positive correlation with well-being and a negative correlation with mental distress.

Physical activity is one of the greatest causes of injury, and injury is one of the most common reasons that athletes stop participating in sport. Hardiness has proven to
decrease injury occurrence in athletes. From a clinical perspective, it would be beneficial to know which athletes are low in hardiness, so that coping or stress management resources are available to them. Such an intervention could decrease injury occurrence.

Hardiness is a necessary trait for athletes as they often encounter challenges and setbacks. It has been reported in the literature that hardiness is a moderator of the stress response so that those with high hardiness are not as affected by negative events compared to those with low hardiness. This is important as physical activity is one of the most common causes for injury. There is little research to determine if athletes of different sports differ in hardiness levels, and the available research is conflicted. However, this information is important to know so that those with low hardiness may be trained to increase their hardiness. This will equip them to excel despite difficulties and could improve performance.

**Operational Definitions**

Hardiness is defined as the personality skill of overcoming difficult situations through commitment, control, and challenge. It was measured using the Dispositional Resilience Scale-15 (DRS-15). It is made up of 15 items to be rated on a 4-point (0-3) Likert scale. An equal number of items are devoted to each subscale (5 items each). Higher scores indicate higher hardiness.

Quality of life (QoL) is a construct that takes into account multiple aspects of an individual’s life including health, independence, life satisfaction, and well-being. There are many instruments to measure quality of life, each of them using different components. Some instruments focus on objective quality of life which includes health,
functional well-being, and independence. Other instruments focus on subjective quality of life which includes life satisfaction and well-being. It was measured in this study using the World Health Organization Quality of Life-BREF (WHOQOL-BREF) which is made up of 26 items. Higher scores indicate higher quality of life.

A traumatic life event was defined as an event that causes a change in an individual’s lifestyle.

**Delimitations**

Participants were limited to students and athletes at a Division I university. Those who had experienced a negative life event in the past 6 months were excluded from QoL analyses.

**Assumptions**

Participants answered questions honestly and remember previous injuries accurately.

**Limitations**

A cross-sectional design limits data collection to one time-point. Cause and effect cannot be established. In addition, it is impossible to determine if quality of life fluctuates with hardiness levels or if hardiness fluctuates with life events.

Participants’ recollection of injuries and events is subject to recall bias.

Injury severity or time span cannot be identified.

It cannot be determined if hardiness is increased because of difficulties such as injuries or if those who have excelled in sport to compete at the collegiate level have had higher hardiness since childhood.
**Statement of the Problem**

Little research has been conducted regarding hardiness differences in athletes of different sports. Hardiness is an important personality trait for athletes as they often encounter stressful situations and challenges. Furthermore, athletes with low hardiness may be more prone to injury as hardiness has a protective effect against injury occurrence. In addition, athletes with low hardiness may not be performing at their highest potential as high hardiness has been found in elite athletes. Mental toughness, a related construct, has shown higher adherence to rehabilitation in injured athletes, so higher hardiness may also increase positive outcomes after rehabilitation. Therefore, it is important for clinicians to know if certain groups of athletes are more prone to have low hardiness so that interventions may be purposefully directed toward them.

In addition, the relationship between hardiness and quality of life has not been established. Research shows that hardiness is a moderator of the stress response and can impact mental health and overall health. Decreased stress and increased mental health improve quality of life; therefore, an individual’s quality of life may be positively influenced by increasing hardiness.

**Research Hypothesis**

1. Hardiness components will be different between sport groups (contact vs. non-contact, team vs. individual).
2. Hardiness components and quality of life will have a moderate positive correlation.
Independent Variable

The independent variable in the first aim was the participants’ classification (contact or non-contact athlete, individual or team athlete, or non-athlete). In the second aim, QoL score as measured by the WHOQOL-BREF was the independent variable.

Dependent Variable

The dependent variable for both aims was participants’ hardiness component scores as measured by the DRS-15.

Specific Aims

1. Determine if there are differences in hardiness components between athletes of different sport groups (contact vs. non-contact, individual vs. team).
2. Determine if there is a relationship between hardiness components and QoL in collegiate athletes and non-athletes.
II. LITERATURE REVIEW

This chapter provides a review of the literature for the proposed research. Information is included regarding hardiness, quality of life, and research regarding these constructs in university student-athletes and non-athletes.

Hardiness

Hardiness is a trait that helps people thrive in difficult situations and have resilience in hardships or setbacks. It has been conceptualized as an aspect of personality and as learned attitudes that help people maintain health and performance despite obstacles. Although it contributes to an individual’s behaviors and reactions, it is an aspect of personality that is developed in early childhood and typically remains stable over time, although it is not impossible to improve one’s hardiness. In this study, it will be considered a trait that can be strengthened with intentional training.

Hardiness has 3 components (e.g., commitment, control, & challenge) that all contribute to one’s overall hardiness level. Commitment describes the tendency to be involved in the stressful situation instead of avoiding it. Control describes the aspect of not being helpless in a stressful situation. Challenge describes the belief that changes are opportunities for growth instead of something to be dreaded.

Hardiness is a necessary trait for athletes because they will face hardships and difficulties in and out of sport, and it can moderate the negative effects of these stressful circumstances. It has also moderated the relationship between negative life events and injuries. According to Nazarzadeh et al., this is accomplished by using social support, effective coping, and assessing the stressful situation. Those with high hardiness will react with less stress compared to those with low hardiness. It is important to note that
Hardiness does not decrease one’s perception of a situation as stressful, but they will have the resources and hardy habits to handle the stress.\textsuperscript{1} When controlling for other personality traits, hardiness has resulted in better health and stress management.\textsuperscript{27} In contrast, researchers found that other personality factors did not contribute to its effect.\textsuperscript{28} Even stress levels have not been found to change the relationship between hardiness and strain levels in multiple studies.\textsuperscript{28}

Hardiness can also improve athletic performance. Higher hardiness has been found in high-performing and elite athletes compared to athletes performing at lower levels of competition.\textsuperscript{20,29,30} They must overcome stressful situations and be adaptable in and out of sport. In a sample of high school basketball players, high hardiness was directly related to higher performance in games and negatively related to poor performance.\textsuperscript{31} Female Olympic swimmers were also found to have higher hardiness compared to swimmers that did not make the Olympic team.\textsuperscript{19} Even within the Olympic team, those who had poorer performance scores at the Olympics event also had lower hardiness scores than those with high scores.\textsuperscript{19}

**Hardy behaviors**

Hardiness is a trait that is expressed with certain behaviors. Hardy coping, hardy social interactions, and hardy self-care are all a part of hardiness.\textsuperscript{1}

**Coping**

Coping can be defined as an individual’s efforts to deal with a changing situation.\textsuperscript{32} Researchers have identified 3 different coping strategies: problem-focused, emotion-focused, and avoidant.\textsuperscript{32-34} Problem-focused coping is considered hardy coping.\textsuperscript{3,5}
Problem-focused coping aims to solve the problem or lessen its impact.\textsuperscript{34} It is characterized by action steps like planning, researching, or seeking advice from those who have experienced the same thing.\textsuperscript{32} For example, this could mean talking to teammates who have had the same injury or making a plan to study more for a difficult class. Research has shown that problem-focused coping is more effective when used regularly.\textsuperscript{32} Hardy people use problem-focused coping in taking proactive steps to find solutions to their situation.

Emotion-focused coping is similar to problem-focused, but the athlete is striving to resolve or manage the emotions resulting from the stressful situation.\textsuperscript{32,34} This can be done by venting or seeking emotional support from others, self-blame, and humor.\textsuperscript{32} A couple examples of this style of coping could be talking to a close friend without seeking practical advice or convincing oneself that it was their fault they were injured.

Avoidant coping is seeking escape from the situation, whether that escape is physical or emotional.\textsuperscript{32,33} This could be demonstrated by disengagement, self-distraction, and denial.\textsuperscript{32} More specifically, disengagement is behavior that is aimed away from the distress.\textsuperscript{34} This could look like not telling anyone about what happened or watching TV to distract oneself from the situation.

High levels of hardiness have been found in athletes who use more problem- and emotion-focused coping.\textsuperscript{3} In addition, problem-focused coping was found more in athletes with high hardiness.\textsuperscript{32} Hardiness allows athletes to use a beneficial coping strategy to deal with a stressful or negative situation.\textsuperscript{3} While avoidant coping is not always a negative response, it is an ineffective strategy long-term because the athlete is not dealing with the situation.\textsuperscript{34} Those who have used avoidant coping for an extended
period of time tend to feel that their situation was not resolved.\textsuperscript{33} Certain populations, such as elite athletes, may not show an interaction of maladaptive coping and injury occurrence because athletes at this level have already learned how to cope effectively.\textsuperscript{35}

\textit{Social interactions}

Although social support is often studied in conjunction with stress and life events, within this review it will be considered a strategy that hardy people use to overcome their current situation. Hardy social support means seeking support from loved ones and being willing to support others as well.\textsuperscript{1} The opposite is Type A behavior or competitiveness.\textsuperscript{1} Those who do not use hardy social interactions tend to feel victimized and punish those around them.\textsuperscript{1} It could also be demonstrated by being overprotective of loved ones.\textsuperscript{1} Hardy people are thought to seek out social support.\textsuperscript{27} They also perceive family and work environments as socially supportive.\textsuperscript{1}

\textit{Self-care}

Hardy self-care includes a balanced diet, regular physical activity, and relaxation procedures.\textsuperscript{1} Self-care is important in order to make sure one has enough energy for hardy coping and social interactions, but self-care on its own does not contribute to lower stress levels.\textsuperscript{1} Those without hardy self-care do not exercise and allow themselves to consume sugary and fatty foods. They also have no method of relaxing or calming themselves when stress arises.\textsuperscript{1}

\textit{Development}

Hardiness is conceptualized as a set of patterns that a person has learned or a disposition.\textsuperscript{1,36} One is not born with hardiness, but it is originally developed at a young age. This is achieved by encountering challenges and being encouraged to seek help from
others. Some develop more hardiness in their childhood through difficult situations such as moving to a new state or parents divorcing. For example, managers of a telephone company with high hardiness grew up with many challenges or changes. Higher hardiness has been found in high-performing and elite athletes compared to athletes at lower competitive levels of the same sport. They must overcome stressful situations and be adaptable in and out of sport. Often athletes are balancing rigorous class schedules with practices and travel for sport. Others have very consistent childhoods and may not have opportunities to increase their hardiness until they reach adulthood. Adults can still improve in hardiness, but it is a very intentional process. They must retrain their mind to reframe negative situations to find how the situation can be improved.

Hardiness Training

As previously stated, hardiness can be trained. Research has shown that hardiness training can decrease perceived stress levels and help people overcome obstacles. This training is a 4-step process that mainly focuses on enhancing problem-solving coping with the goal of developing an Action Plan. If the previous step in the process was unsuccessful, the next steps are designed to get the trainee unstuck in how they examine the situation.

The first step is Situational Reconstruction. The trainee is encouraged to think of a stressful situation in their lives and think about how it could get better or worse. They then should think about ways they could increase the likelihood of it getting better or decrease the likelihood of it getting worse. These strategies go towards developing the Action Plan. The second stop is Focusing. This step involves overcoming one’s natural defensive or emotional reaction to the situation. If they are having trouble getting past
their initial reaction to the situation, trainees should pay attention to bodily signals and emotions in order to find a new insight toward the situation. The third step is Compensatory Self-Improvement. If the stressful situation cannot be resolved, the trainee should find a related situation and determine what they can do to alleviate the stresses associated with this secondary situation.

To illustrate this process, imagine an athlete who just experienced a season-ending injury. In the first step, they will think about how this situation could be better or worse. On one hand, the injury could keep them out of sports for the rest of their life. On the other hand, they could learn a lot from watching their teammates play and have improved strategy for the game when they return. If he is too disappointed or upset by sitting out the rest of the season to complete Situational Reconstruction successfully, they would move to step 2, Focusing. They should determine how they feel about the situation. They could discover that their disappointment and frustration come from fear that they will lose their starting position and not have as much playing time when they do recover. If after this step, he determines that there is no way to resolve this situation, he should think of a situation related to his injury to improve to complete step 3, Compensatory Self-Improvement. He could find ways to be a good teammate even though he cannot participate.

An Action Plan is developed through one of the previous steps explained and includes the goal and the sequential steps to be taken to achieve this goal. In carrying out the Action Plan, the trainee’s hardy attitudes are deepened. Feedback from mentors and others are important in this process. The trainee should specifically look for feedback in how their efforts helped the situation, support from others, and how the stress was
alleviated through the process. As they go through this process successfully, it encourages them to continue with hardy attitudes and habits.

**Measurement**

Surveys can provide a quantitative measure of a subjective concept, such as a personality construct. This provides researchers and clinicians a way to determine an individual’s level of hardiness. Several measures of hardiness and their psychometric properties will be reviewed in the following section.

*Dispositional Resilience Scale-15*

The Dispositional Resilience Scale-15 (DRS-15) is a 15-item survey developed by Bartone et al. from a longer 30-item version of the Dispositional Resilience Scale. Items are rated on a 4-point Likert scale anchored by “not at all true” (0) and “completely true” (3). Each of the 3 components (commitment, challenge, and control) have 5 items to assess them. Sample items include “It bothers me when my daily routine gets interrupted” and “Most of my life gets spent doing things that are meaningful.” The Cronbach alpha value for the measure is .83 and ranges from .58 to .81 for the individual components showing good reliability. The test-retest reliability coefficient for the hardiness score was .78 and ranged from .58 to .81 for the individual components. It has been shown to have criterion validity in multiple samples. Construct validity has been proven by exploratory factor analysis.

*Hardiness Scale*

The Hardiness Scale (HS) is composed of 45 items which participants respond to on a 4-point Likert scale. It has demonstrated internal consistency reliability on all 3
subscales and the total hardiness score. The test-retest reliability is .88 for total hardiness.

**Personal Views Survey, Third Edition-Revised**

The Personal Views Survey, Third Edition-Revised (PVS III-R) is the most recent version of the Personal Views Survey developed by Maddi et al. It is comprised of 18 items with 6 items devoted to each component of hardiness. Items are rated on a 4-point Likert scale with 3 positively- and negatively-scored items for each component. Example items include “Trying your best at what you do usually pays off in the end” and “It's hard to imagine anyone getting excited about working.” The PVS III-R has demonstrated adequate validity with the Personal Views Survey III. Internal consistency shows a coefficient alpha of 0.80 for the measure and ranged from .57 to .69 for the individual components. Construct validity has been proven in the PVS III-R.

**Cognitive Hardiness Scale**

The Cognitive Hardiness Scale is comprised of 30 items. Individuals rate how much they agree with a statement on a 5-point Likert scale anchored by “Strongly Agree” (1) and “Strongly Disagree.” (5). It includes items such as “My involvement in nonwork activities and hobbies provides me with a sense of meaning and purpose.” It has a high internal consistency reliability of .83. Its criterion validity has been proven by contributing to predictions of psychological health but not physical health. It has shown adequate convergent validity with the original DRS.

**Comparison of Scales**

The DRS-15 has the highest internal consistency for individual components, but the Cognitive Hardiness Scale has the highest total internal consistency. Test-retest
reliability was highest in the HS but was not reported for the PVS III-R or Cognitive Hardiness Scale. The HS and Cognitive Hardiness Scale have higher reliability but are much longer than DRS-15 and PVS III-R and will not be as feasible to be used in the current study. Criterion and construct validity have been established in the DRS-15. Construct validity has been proven in the PVS III-R, but criterion validity has not been reported.

**Importance**

Hardiness is an important skill to have because of its influence on other parts of an individual’s life. The link between hardiness and stress is well-established.\(^{24}\) It has been suggested that stress affects mental health and quality of life. Hardiness was found to contribute to better mental health in a structural analysis study.\(^5\) It would follow then, that those who are more able to adequately deal with stresses would have greater quality of life.

**Quality of Life**

Quality of life (QoL) is a multidimensional concept that includes all facets of an individual’s well-being, including physical, emotional, and psychological health.\(^{14}\) Depending on the context, QoL can mean different things.\(^{14,15}\) In healthcare, we are most often concerned with health-related QoL (HRQoL).\(^{14}\) This is a more objective perspective as it considers functional health status.\(^{16}\) Life satisfaction is a more subjective aspect of QoL.\(^{16}\) The World Health Organization (WHO) defines QoL as “an individual’s perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns.”\(^{16}\)
Measurement

Several measures of quality of life will be reviewed in the following section. Quality of life is a broad concept that includes objective and subjective dimensions. For this study, objective QoL will be more important.

Comprehensive Quality of Life Scale

The Comprehensive Quality of Life Scale (ComQoL) uses 35 items that fit into 7 domains to measure QoL. The domains are material well-being, health, productivity, intimacy, safety, place in society, and emotional well-being. For each domain individuals rate their satisfaction within this domain on a 7-point Likert scale anchored by “delighted” and “terrible.” They then rate the importance of the domain on a 5-point Likert scale anchored by “no importance” (1) and “could not be more important” (5). Cronbach alphas for the importance subscale is .65 and for the satisfaction subscale is .73, showing acceptable internal reliability. The satisfaction scores of all 7 domains were able to correctly classify high or low subjective QoL in 100% of participants in a sample of college students and staff.

Assessment of Quality of Life

The Assessment of Quality of Life (AQoL) assesses 5 facets of HRQoL: illness, independent living, social relationships, physical senses, and psychological well-being. The AQoL is composed of 15 items with 3 items for each facet. The reliability coefficient for the whole scale is .81 and ranged from .52 to .86 for individual facets. Each facet has been proven to be unidimensional. Comparative fit index was .90 so that 90% of the variance in scores was explained by the AQoL.
Quality of Life Inventory

The Quality of Life Inventory (QOLI) measures life satisfaction, positive mental health, and well-being. It is made up of 17 items covering 17 domains. Individuals rate their level of satisfaction with the domain as well as how important that domain is to them, and the score is calculated by multiplying the satisfaction score by the importance score for each item. It achieved good internal reliability with a value of .87 in a sample of student veterans and is sensitive enough to detect changes in mental health due to treatment. Quality of Life Inventory scores with GPA have been shown to predict retention in college students.

World Health Organization Quality of Life Scale-BREF

The World Health Organization Quality of Life Scale-BREF (WHOQOL-BREF) is an abbreviated version of the original 100-item WHOQOL to measure HRQoL. It measures both objective and subjective components of QoL as it assesses HRQoL and asks about life satisfaction as well. It uses the 26 most reliable items from the WHOQOL-100 and includes 4 domains of physical health, psychological, social relationships, and environment. Scores of the shortened survey correlate well with the WHOQOL-100 and Short-Form-36. Construct validity was proved by a comparative fit index of .901. This survey has good internal consistency ranging from 0.68 to 0.82 among the 4 domains. It is able to differentiate between subgroups of people based on employment, marital status, and physical abilities.

Satisfaction with Life Scale

Life satisfaction is one way to measure QoL. It tends to stay consistent across situations and time. The Satisfaction with Life Scale (SWLS) measures an individual’s
global perspective on their life satisfaction with 5 items. Each item is rated on a 7-point Likert scale anchored by “strongly disagree” (1) and “strongly agree” (7) and takes less than 5 minutes to complete. It has a high internal consistency of .88. The SWLS correlated well with predictors of subjective well-being in those with spinal cord injury.50

Comparison of Scales

The surveys discussed above do not all use the same components of QoL or even the same number of components within QoL. In addition, some of the measures focus on subjective or objective QoL. The ComQoL, QOLI, and SWLS consider the subjective aspects of QoL. The AQoL measures HRQoL. The WHOQOL-BREF measures both objective and subjective components of QoL.

The ComQoL and QOLI take into account the importance of the item to the individual, weighting the satisfaction scores. The SWLS is the shortest measure with only 5 items and boasts the highest reliability (.88). All measures discussed have reliability of at least .80 with the exception of ComQoL (.73) which is also the longest survey. The WHOQOL-BREF and AQoL have good construct validity (.90). The WHOQOL-BREF is appropriate to use with cross-cultural populations16, but overall internal consistency for the measure was not reported.

Value of Quality of Life

The World Health Organization defines health as “a state of complete physical, mental and social well-being, and not merely the absence of disease.”14 Quality of life can be impacted by life events and daily stressors. In addition, the nature of the event influences the resulting fluctuation in QoL.51 For example, a positive life event will increase one’s QoL while a negative event will decrease one’s QoL. Research shows that
despite these fluctuations, QoL tends to return to the level it was before the event.\textsuperscript{51} In some situations, a life event can permanently alter an individual’s QoL, especially if it causes long-lasting effects in their daily life.\textsuperscript{51}

Hardiness has a role in moderating stress and can decrease mental health issues. Hardiness has been found to predict mental health at the end of a training program in combat trainees.\textsuperscript{5} At the end of military missions, those with low hardiness were more likely to suffer from mental health problems such as depression upon return.\textsuperscript{2} It is well-understood that stress and mental health influence quality of life, but it is not yet known if hardiness and quality of life are related.

\textit{Injury-Related}

Health-related quality of life (HRQoL) is a patient-oriented outcome that examines physical, mental, and social function and well-being.\textsuperscript{52} For example, HRQoL could be measured after injury and throughout the recovery process to enable the clinician to treat the patient holistically. Athletes currently recovering from injury had lower HRQoL scores than those recovered from a past injury,\textsuperscript{53} and HRQoL increased from post-injury to recovery\textsuperscript{54}.

\textbf{Psychological Variability across Sports}

Personality differences have been seen in athletes of individual sports compared to team sports.\textsuperscript{55,56} Individual-sport athletes were higher than team sport athletes in energy and openness.\textsuperscript{55} They were also higher in positive personal-trait-like individual differences (i.e. perseverance, self-efficacy, positivity, resilience, and self-esteem).\textsuperscript{56} In a high school population, aggression was higher in contact sports compared to non-contact sports.\textsuperscript{57} It would follow then, that hardiness levels could vary across sports as well. For
example, runners do not have the same coping options as the general population or even other athletes. They are not able to use jogging for a stress outlet because it may be too similar to what they already do every day. Team sports may have higher hardiness because of their access to social support. These differences may contribute to differences in hardiness. There have been few published studies examining differences in levels of hardiness across sports. Understanding the differences across sports is important so that interventions can be focused to low-hardy individuals.

**Statement of the Problem**

Hardiness is a personality trait that can make an athlete more successful in sport and in life.\textsuperscript{1,31} Differences in sport environment make it possible that hardiness would vary across sports, but this has not been confirmed in the literature. This is important to discover so interventions to improve hardiness can be directed to specific sports. It may also lead to further research to discover why certain sports tend to have lower hardiness and correct these imbalances.

**Specific Aims**

1. Determine if there are differences in hardiness components between athletes of different sport groups.

2. Determine if there is a relationship between hardiness and QoL among collegiate athletes and non-athletes.
III. METHODS

This study examines the relationship between hardiness and quality of life in student-athletes and non-athletes. This chapter describes the design of the study, participants involved, instruments, procedures, and data analysis.

Design

This study used a cross-sectional observational design to examine hardiness and quality of life among university students and student-athletes.

Participants

A power analysis was conducted to estimate an appropriate sample size for this study using G*Power (version 3.1). The suggested sample size for this study based upon a power of 0.80, alpha level 0.05, and a small effect size (Cohen’s d = 0.25) is 158 participants. Multiple sports were recruited so that athletes of different sports may be compared.

The inclusion criteria were university students who were at least 18 years old. Exclusion criteria were individuals who have experienced a traumatic life event in the past 6 months. These participants were excluded from analyses of QoL because traumatic life events may temporarily affect their QoL levels. A traumatic life event was defined as a major life event that alters one’s lifestyle.

Instruments

Demographic Questionnaire

Demographic information was collected from participants. This included age, sex, height, weight, academic classification, athlete history, and injury history. It is important to know how long athletes have been participating in sport because this may affect
hardiness levels. Injuries are an obstacle that all athletes must overcome, so it would be relevant to the present study.

**Dispositional Resilience Scale-15**

The Dispositional Resilience Scale-15 (DRS-15) is a 15-item survey developed by Bartone et al. from a longer 30-item version of the Dispositional Resilience Scale. Items are rated on a 4-point Likert scale anchored by “not at all true” (0) and “completely true” (3). Each of the 3 components (commitment, challenge, and control) have 5 items to assess them. Sample items include “By working hard you can nearly always achieve your goals” and “I don't like to make changes in my regular activities.” The Cronbach alpha value for the measure is .83 and ranges from .58 to .81 for the individual components showing good reliability. The test-retest reliability coefficient for the hardiness score was .78 and ranged from .58 to .81 for the individual components. It has been shown to have criterion validity in multiple samples. Construct validity has been proven by exploratory factor analysis. Scores are calculated by adding participants’ ratings after select items are reverse-scored and can range from 0-45. Component scores can range from 0-15.

**World Health Organization Quality of Life Assessment-BREF**

The World Health Organization Quality of Life Assessment-BREF (WHOQOL-BREF) is a validated instrument to measure HRQoL. It is comprised of 26 items taken from the original 100-item WHOQOL that fit into 4 domains (physical health, psychological, social relationships, environment) with 2 global items not included in a domain. Sample items include “How healthy is your physical environment?” and “To what extent do you feel that physical pain prevents you from doing what you need to do?” The WHOQOL-BREF scores correlate well with the WHOQOL-100 and Short
Evidence of construct validity was established using confirmatory factor analysis (Comparative Fit Index = .901). The WHOQOL-BREF has good internal consistency ranging from 0.66 to 0.84 among the 4 domains. It is able to differentiate between subgroups of people based on employment, marital status, and physical abilities. A higher score indicates higher QoL.

**Study Procedures**

University students were invited to participate in this research study via email, Teamworks, flyers, and in-person. A questionnaire was hosted online using Qualtrics. The survey contained a brief description of the study procedures, an informed consent statement, the demographic questionnaire, the DRS-15, and the WHOQOL-BREF. To help with completion of the questionnaire, the principle investigator provided participants with an online-ready iPad that can be used to access and complete the questionnaire. Participants were also able to complete the questionnaire by accessing the following link (https://txstate.co1.qualtrics.com/jfe/form/SV_1Hqm0aNKNFfScKh) from their personal computer or tablet devices. The questionnaire took 8 minutes on average to complete. Participants consented by clicking to the questionnaire. The protocol, questionnaire, and recruitment materials for this study was approved by the University’s Institutional Review Board prior to the start of data collection for this study.
Data Analysis

Specific Aim 1:

Factorial analysis of variance (ANOVA) determined if there were differences in hardiness components between university athletes of different sport groups and non-athletes. Follow-up testing was performed using Bonferroni post-hoc. A familywise alpha of .008 (.05/6) was set a priori.

Specific Aim 2:

Pearson Product Moment Correlation determined if there was a relationship between hardiness components and QoL in non-athletes and university athletes. Significance was set a priori at .05.
IV. MANUSCRIPT

Introduction

Hardiness is a personality trait that helps individuals more effectively deal with obstacles and challenges and maintain health and performance despite those challenges.\textsuperscript{1,2} Those high in hardiness are more equipped to handle stress and effect a positive outcome without giving up.\textsuperscript{1} Hardy behaviors (problem-focused coping, supportive social interactions, self-care) help them find a solution to the challenging situation instead of being overcome by it.\textsuperscript{1} Individuals develop hardiness throughout childhood as they encounter problems and learn how to work through them.\textsuperscript{1,3} Not everyone will have the same challenges throughout life; therefore, it is expected that some will be lower in hardiness than others.

Furthermore, hardiness has a protective effect on mental health in stressful situations.\textsuperscript{4,5} As increased stress is correlated with decreased quality of life\textsuperscript{6}, it may be that increased hardiness correlates with higher quality of life. Those lower in hardiness are less equipped to handle stress\textsuperscript{1} and are more at risk for injury\textsuperscript{2} and decreased mental health.\textsuperscript{5} Collegiate students are especially at risk for suffering negative effects of stress during the transition to college\textsuperscript{7} and when negative life events occur\textsuperscript{6}. As mental health becomes a growing concern in the adolescent population, it is important to know how college students and student-athletes vary in hardiness.

Athletes from specific sports vary in personality traits. For example, aggression and conscientiousness are both higher in contact sports than in non-contact sports.\textsuperscript{8,9} Athletes of individual sports have been found to be higher in perseverance, resilience, self-efficacy, energy, and openness compared to athletes of team sports.\textsuperscript{10,11} As each sport
has their own culture and varies in the types of injuries and challenges faced, it may be that an individual’s sport plays a role in their hardiness level. For example, athletes of team sports may feel they have more social support than athletes of individual sports since it is built into their sport; however, athletes of individual sports may have developed more skills related to seeking social support.

Hardiness is an important trait regarding mental health1,4,5, but it is not clear from the literature to date if hardiness varies by an athlete’s sport. It is necessary to understand how different types of sports vary in hardiness to identify athlete groups that may be at risk for low hardiness levels. This knowledge could allow clinicians to develop targeted interventions for those groups. It may also lead to future research determining why differences exist across sports and allow clinicians to correct these imbalances. In addition, most of the hardiness research in athletics used a broad sample of athletic abilities (recreational to professional) or examined only professional athletes. The current study adds to the literature by using a focused sample of collegiate athletes and non-athletes. Therefore, the purposes of this study are to 1) determine if differences in hardiness components exist between sport groups (contact vs. non-contact, team vs. individual) in a collegiate sample and 2) determine if quality of life is associated with hardiness components in collegiate athletes and non-athletes.

**Methods**

**Study Design**

This cross-sectional study collected survey data from student-athletes and non-athletes at a Division I university. The protocol, questionnaire, and recruitment materials
for this study were approved by the University’s Institutional Review Board prior to the start of data collection for this study.

**Participants**

Athletes and non-athletes were recruited to participate in this study. Non-athletes were used as a control group when testing for hardiness differences between sport groups. The suggested sample size for examining differences in hardiness levels between sport groups (contact vs. non-contact; team vs. individual) and non-athletes was determined through a power analysis using G*Power (version 3.1). Parameters for the power analysis were as follows: F-test, power of 0.80, alpha level 0.05, small effect size (Cohen’s $d = 0.25$) and, 3 groups, which resulted in an estimated sample size of 159 participants. To account for non-compliance and incomplete surveys, oversampling of 20% was used resulting in a targeted sample size of 200 participants (150 athletes and 50 non-athletes). Multiple sports were recruited so that athletes of different sports could be compared.

University students who are at least 18 years old were eligible for inclusion. Participants were excluded from analyses of QoL if they self-reported, on their demographic questionnaire, having a life event in the past 6 months because life events may temporarily affect their QoL levels. A life event is defined as a positive or negative event that alters one’s lifestyle and could include a long-term injury, divorce, having a child, moving to a new city, etc.
Instruments

Demographic Questionnaire

Demographic information was collected from participants. This included age, sex, height, weight, academic classification, athlete history, and injury history. Injuries are an obstacle that all athletes must overcome, so it is relevant to the present study.

Dispositional Resilience Scale-15

The Dispositional Resilience Scale-15 (DRS-15) is a 15-item survey developed by Bartone et al.15 from a longer 30-item version of the Dispositional Resilience Scale. Items are rated on a 4-point Likert scale anchored by “not at all true” (0) and “completely true” (3).16 Each of the 3 components (commitment, challenge, and control) have 5 items to assess them. A list of the DRS-15 items is provided in Appendix A. Scores are calculated by adding participants’ ratings after select items are reverse-scored and can range from 0-45.17 Component scores can range from 0-15.17

World Health Organization Quality of Life Assessment-BREF

The World Health Organization Quality of Life Assessment-BREF (WHOQOL-BREF) is a measure of health-related quality of life (HRQoL).18 Validity for measuring HRQoL has been established through comparing results to the Short Form-36 and the full-length WHOQOL.19,20 It is comprised of 26 items taken from the original 100-item World Health Organization Quality of Life Assessment (WHOQOL-100) that fit into 4 domains (physical health, psychological, social relationships, environment) with 2 global questions not put into domains.20 Sample items include “How healthy is your physical environment?” and “To what extent do you feel that physical pain prevents you from
doing what you need to do?”. For this study, the score is obtained by summing the item responses, and scores can range from 26-130. A higher score indicates higher QoL.

**Procedures**

University students were invited to participate in this research study via email, Teamworks (athlete engagement software), flyers, and in-person. A questionnaire was hosted online using Qualtrics. The survey contained a brief description of the study procedures, an informed consent statement, the demographic questionnaire, the DRS-15, and the WHOQOL-BREF. To facilitate completion of the questionnaire, the principle investigator provided participants with an online-ready iPad that could be used to access and complete the questionnaire. This was done at various locations on campus, including athletic training rooms and academic buildings. When data collection was performed in-person, names were not requested or collected. Participants were also able to complete the questionnaire by accessing a Qualtrics link from their personal computer or tablet devices. The questionnaire took approximately 15 minutes to complete. Participants consented by clicking to the questionnaire.

**Data Analysis**

Separate factorial analyses of variance (ANOVA) examined differences in the components of hardiness (e.g., commitment, control, challenge) among different sport groups and sex. In the first set of analyses groups included contact athletes, non-contact athletes, and non-athletes. In the second set of analyses groups included individual-sport athletes, team-sport athletes, and non-athletes. A separate analysis (n=6) was conducted for each component. Follow-up testing was performed using Bonferroni post-hoc analyses. A familywise alpha of .008 (.05/6) was used to determine significance for all
main effects. Pearson Product Moment Correlation determined if there is a relationship between the components of hardiness and QoL. Significance was set a priori at .05. All analyses were performed using IBM SPSS Statistics for Windows, version 25.0 (IBM Corp., Armonk, N.Y., USA).

**Results**

One hundred fifty-two (20.55±1.88 years, 44.1% female) participants were recruited for the online survey. Demographic characteristics of participants are displayed in Table 1, and sport frequencies are displayed in Table 2.
Table 1. Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>85 (55.9)</td>
</tr>
<tr>
<td>Female</td>
<td>67 (44.1)</td>
</tr>
<tr>
<td>Academic classification</td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>21 (13.8)</td>
</tr>
<tr>
<td>Sophomore</td>
<td>37 (24.3)</td>
</tr>
<tr>
<td>Junior</td>
<td>42 (27.6)</td>
</tr>
<tr>
<td>Senior</td>
<td>42 (27.6)</td>
</tr>
<tr>
<td>Graduate</td>
<td>10 (6.6)</td>
</tr>
<tr>
<td>Athletic status</td>
<td></td>
</tr>
<tr>
<td>Athlete</td>
<td>103 (67.8)</td>
</tr>
<tr>
<td>Non-athlete</td>
<td>49 (32.2)</td>
</tr>
<tr>
<td>Competitive level</td>
<td></td>
</tr>
<tr>
<td>Collegiate Division I</td>
<td>94 (61.8)</td>
</tr>
<tr>
<td>Collegiate Division II</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Collegiate Division III</td>
<td>1 (0.7)</td>
</tr>
<tr>
<td>Club sports</td>
<td>21 (13.8)</td>
</tr>
<tr>
<td>High school</td>
<td>18 (11.8)</td>
</tr>
<tr>
<td>Recreational</td>
<td>3 (2.0)</td>
</tr>
<tr>
<td>Other&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3 (2.0)</td>
</tr>
<tr>
<td>None</td>
<td>11 (7.2)</td>
</tr>
<tr>
<td>Total</td>
<td>152 (100.0)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Other Competitive level included unspecified and International.

Table 2. Primary Sport Frequency of Athletes

<table>
<thead>
<tr>
<th>Sport</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseball</td>
<td>7 (6.8)</td>
</tr>
<tr>
<td>Basketball</td>
<td>7 (6.8)</td>
</tr>
<tr>
<td>Football</td>
<td>29 (28.2)</td>
</tr>
<tr>
<td>Ice hockey</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>Lacrosse</td>
<td>4 (3.9)</td>
</tr>
<tr>
<td>Powerlifting</td>
<td>4 (3.9)</td>
</tr>
<tr>
<td>Soccer</td>
<td>12 (11.7)</td>
</tr>
<tr>
<td>Softball</td>
<td>2 (1.9)</td>
</tr>
<tr>
<td>Tennis</td>
<td>2 (1.9)</td>
</tr>
<tr>
<td>Track and Field</td>
<td>28 (27.2)</td>
</tr>
<tr>
<td>Volleyball</td>
<td>7 (6.8)</td>
</tr>
<tr>
<td>Total</td>
<td>103 (100.0)</td>
</tr>
</tbody>
</table>

Of those who participated, 150 completed the DRS-15, and 148 completed the WHOQOLBREF. A total of 50 participants were excluded from the correlation for
various reasons: 18 participants were excluded due to reporting a significant life event in
the past 6 months, and 32 participants were excluded due to missing data. Mean scores
for the DRS-15 components and WHOQOL-BREF are displayed in Table 3. There was
no significant difference in hardiness among contact athletes, non-contact athletes, and
non-athletes in any of the hardiness components (p>.008). Regarding team-sport athletes,
individual-sport athletes, and non-athletes, challenge was lower in individual athletes
($F_{2,145}=5.03$, $p<.01$). There was a moderate positive correlation between commitment and
QoL ($r^{96}=.57$, $p<.01$) and control and QoL ($r^{97}=.44$, $p<.01$). Figure 1 and 2 display the
correlation between QoL scores and commitment and control, respectively.

| Table 3. Hardiness Component and Quality of Life Scores in Comparison Groups (Mean±SD) |
|---------------------------------|-----------|-----------|-----------|-----------|----------------|
| Group                          | Hardiness Score$^b$ | Commitment$^c$ | Control$^c$ | Challenge$^c$ | Quality of Life Score$^d$ |
| Contact                        | 30.09±4.76    | 10.52±2.91     | 11.82±2 .20   | 7.76±2.37     | 104.41±12.26    |
| Non-contact                    | 28.15±5.17    | 10.16±2.22     | 11.31±2 .43   | 6.65±2.68     | 101.61±10.21    |
| Team-sport                     | 29.14±4.69    | 10.12±2.54     | 11.40±2 .15   | 7.57±2.18     | 104.30±10.50    |
| Individual-sport               | 28.12±5.83    | 10.59±2.30     | 11.62±2 .75   | 5.91±3.07     | 98.33±11.72     |
| Non-athletes                   | 29.56±5.09    | 10.52±3.00     | 11.86±2 .51   | 7.18±2.60     | 101.10±8.60     |

$^a$Contact/Non-contact and Team-sport/Individual-sport athletes are the same participants grouped differently. Non-athletes are displayed once because they were the same participants for both ANOVAs.

$^b$Hardiness was measured using the Dispositional Resilience Scale-15 (DRS-15).

$^c$Commitment, Control, and Challenge are components of hardiness measured using 5 items each of the DRS-15.

$^d$Quality of life was measured using the World Health Organization Quality of Life Scale-BREF (WHOQOL-BREF). Those who reported a significant life event in the past 6 months or had missing data (life event or WHOQOLBREF items) were excluded from this analysis.

$^e$This comparison was significant ($P=.008$).
Figure 1. Correlation of Quality of Life scores with commitment scores of collegiate athletes and non-athletes. Commitment is a component of hardiness, measured by 5 items of the Dispositional Resilience Scale-15. Pearson correlation coefficient and $P$ value are shown.

$$r=0.57, P<.01$$

Figure 2. Correlation of Quality of Life scores with control scores of collegiate athletes and non-athletes. Control is a component of hardiness, measured by 5 items of the Dispositional Resilience Scale-15. Pearson correlation coefficient and $P$ value are shown.

$$r=0.44, P<.01$$
Discussion

The purposes of this study were to determine if hardiness components differ in collegiate athletes of different sport groups and non-athletes and to determine if hardiness components correlate with QoL. The results of the study found that athletes of individual sports were lower in challenge than team-sport athletes and non-athletes. In addition, two of the hardiness components, commitment and control, were positively correlated with QoL.

It was originally thought that personality differences, like the ones seen in aggression\(^8\) and openness\(^10\), would be seen in hardiness components. Grgurinovic et al.\(^22\) found no differences in mental toughness/hardiness scores or individual components (resilience, commitment, control, challenge) between team and individual athletes. However, this was examined in a fairly heterogeneous athletic sample of varying skill and ages.\(^22\) The current study used a more focused sample (similar age, competition level) as recommended by previous research\(^23\) and found that individual sports have lower challenge compared to team sports. This finding conflicts with previous research as Steca et al.\(^10\) found that athletes of individual sports were higher in openness when compared to team sports. Openness and challenge are similar in that those high in these traits are more likely to seek new or different experiences and view them as opportunities instead of threats. Steca et al.\(^10\) used a population from Italy where team sports are more popular, so pursuing an individual sport may indicate higher openness. In contrast, individual sports are not as uncommon in the United States, so it may not necessarily attract those with openness/challenge. Further research is needed to determine if athletes
of individual sports may be lower in challenge but reflect an overall similar hardiness score to athletes of team sports.

Further, there was no difference between athletes and non-athletes in hardiness components. The literature is contradictory as to what the personality differences are between athletes and non-athletes although it is universally accepted that athletes and non-athletes do have personality differences. As concepts of personality and personality assessments have changed drastically since the development of the five-factor model of personality in 1992, there is a lot of variability in how these personality differences are assessed. There is also a difference between how personality functions in reality and personality testing. It may be useful to include questions about hardy habits (problem-focused coping, supportive social interactions, self-care) in addition to a hardy mentality (commitment, control, challenge).

This finding of no differences between athletes and non-athletes contrasts with previous research that has found that hardiness is higher in athletes compared to non-athletes. In addition, Lipowski et al. found that adolescent athletes had higher resilience than their non-athlete peers. Although surprising, there is some support for the results of the current study. Grguronivic et al. found that sports experience did not play a role in hardiness levels. It may be that in the current sample non-athletes are developing hardiness in other ways than through sport. For example, the university where data collection occurred has a 52% minority student population and a robust first-generation college student population. These situations are challenges that may have increased the hardiness of the non-athletes above that of other non-athlete samples. In addition, non-athletes seemed to be retired athletes or physically active in the current sample. This is a
Commitment and control are positively correlated with quality of life in this sample. It is clear in the literature that hardiness affects stress levels, so this finding is not surprising. Many studies have found support for the relationship of hardiness with physical and mental health\textsuperscript{26,27} which are aspects of quality of life. In addition, hardy habits such as coping and social support\textsuperscript{28} have been related to increased well-being and decreased strain. Kobasa\textsuperscript{26} claims that coping is the protective mechanism (mediator) for hardy individuals. In contrast, neuroticism is a trait that is negatively related to hardiness and has a detrimental effect on strain.\textsuperscript{29} Additionally, those high in neuroticism seem to have lower well-being. Those high in hardiness are more likely to engage in active (problem-focused) coping because of the control component.\textsuperscript{29} They take charge of situations and take steps to reduce their stress. Resilience also shows a positive relationship to active coping.\textsuperscript{30}

**Limitations**

This study had several limitations which may contribute to the findings. Mainly, most of the non-athletes in this sample were retired athletes or physically active. Future studies should use a clear delineation between athletes and sedentary non-athletes to reduce confounding. In addition, the sample size was relatively small compared to previous research examining hardiness differences, although it was sufficient to find significance. This sample is from a Division I university, so more research needs to be done to determine the nature of hardiness in different populations. Future research should
seek to have participants from multiple universities, including other Divisions and regions of the country.

**Conclusion**

Challenge was lower in athletes of individual sports compared to team sports. Other than this difference, hardiness component scores were not different among different athlete groups or between athletes and non-athletes. However, there was a moderate positive correlation between commitment and control with quality of life. Regardless of athlete status, higher hardiness is associated with higher quality of life. Future research needs to be done to correct methodological errors when grouping participants regarding hardiness differences in populations.
References


APPENDIX A

Hardiness and QoL Thesis

Q1 Leah Kilchrist, a graduate student at Texas State University, is conducting a research study to investigate the relationships between sports, hardness, and quality of life. You are being asked to complete this survey because you are a student or student-athlete at Texas State University.

Participation is voluntary. The survey will take approximately 15 minutes or less to complete. You must be at least 18 years old to take this survey.

This study involves no foreseeable serious risks. Please try to answer all questions; however, if there are any items that make you uncomfortable or that you would prefer to skip, please leave the answer blank. Your responses are anonymous.

A possible benefit from this study is assisting the sports medicine community by increasing knowledge about hardness levels in athletes of different sports.

Reasonable efforts will be made to keep the personal information in your research record private and confidential. Any identifiable information obtained in connection with this study will remain confidential and will be disclosed only with your permission or as required by law. The members of the research team and the Texas State University Office of Research Compliance (ORC) may access the data. The ORC monitors research studies to protect the rights and welfare of research participants.

Q2 Your name will not be used in any written reports or publications which result from this research. Data will be kept for three years after the study is completed and then destroyed.

If you have questions or concerns, feel free to contact Leah Kilchrist or her faculty advisor:
Leah Kilchrist, graduate student
Health and Human Performance
262-795-2482
lkr186@tstate.edu

Dr. Jim Farnsworth, Assistant Professor
Health and Human Performance
512-465-2939
farnsworth@tstate.edu

If you consent to participate, please check the arrow below and complete the survey. If you do not consent to participate, please close the browser.
Age

Condition: Age Is Less Than 18, Skip To: End of Survey.

Sex

- Male
- Female

What is your academic class standing?

Academic

Freshman

What is your current GPA?

GPA

Based on the categories below, how would you categorize yourself?

- In-season athlete
- Out-of-season athlete
- Retired athlete (formerly participated in organized sport)
- Active non-athlete (participate in physical activity 3-5 times times per week not in organized sport)
- Recreational athlete
- Sedentary non-athlete (participate in physical activity no more than once a week)

Condition: Sedentary non-athlete (part... Is Selected. Skip To: What sports have you participated in?.)
How long have you played your primary sport?

Injury history

Have you ever had an orthopedic injury (e.g., muscles, bones, ligaments)?
- Yes
- No

Condition: No is selected. Skip to: End of Block.

How many injuries have you suffered throughout your athletic career?

Have any of these injuries resulted in time loss from sports greater than 10 days?
- Yes
- No

If yes, how many days were you not able to participate in sports?
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have any of these injuries resulted in surgery?</td>
<td>Yes, No</td>
</tr>
<tr>
<td>How many surgeries due to athletic injuries have you undergone?</td>
<td></td>
</tr>
<tr>
<td>Have you experienced a life-altering event in the past 6 months?</td>
<td>Yes, No</td>
</tr>
</tbody>
</table>

**World Health Organization Quality of Life Scale-BREF**

This assessment asks how you feel about your quality of life, health, or other areas of your life. Please answer all the questions. If you are unsure about which response to give to a question, please choose the one that appears most appropriate. This can often be your first response.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life in the last two weeks. For example, thinking about the last two weeks, a question might ask:

Do you get the kind of support from others that you need?

- 1 Not at all
- 2 Not much
- 3 Moderately
- 4 A great deal
- 5 Completely
You should select the number that best fits how much support you got from others over the last two weeks. So you would circle the number 4 if you got a great deal of support from others as follows.

Do you get the kind of support from others that you need?
- 1 Not at all
- 2 Not much
- 3 Moderately
- 4 A great deal
- 5 Completely

You would circle number 1 if you did not get any of the support that you needed from others in the last two weeks.

Please read each question, assess your feelings, and circle the number on the scale for each question that gives the best answer for you.

How would you rate your quality of life?
- 1 Very poor
- 2 Poor
- 3 Neither poor nor good
- 4 Good
- 5 Very good

How satisfied are you with your health?
- 1 Very dissatisfied
- 2 Dissatisfied
- 3 Neither satisfied nor dissatisfied
- 4 Satisfied
- 5 Very Satisfied
The following questions ask about how much you have experienced certain things in the last two weeks.

<table>
<thead>
<tr>
<th>Question</th>
<th>1 Not at all</th>
<th>2 A little</th>
<th>3 A moderate amount</th>
<th>4 Very much</th>
<th>5 An extreme amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>To what extent do you feel that physical pain prevents you from doing what you need to do?</td>
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<tr>
<td>How much do you need any medical treatment to function in your daily life?</td>
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<tr>
<td>How much do you enjoy life?</td>
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<tr>
<td>To what extent do you feel your life to be meaningful?</td>
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</tr>
</tbody>
</table>

Click to write the question text

<table>
<thead>
<tr>
<th>Question</th>
<th>1 Not at all</th>
<th>2 A little</th>
<th>3 A moderate amount</th>
<th>4 Very much</th>
<th>5 Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>How well are you able to concentrate?</td>
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<tr>
<td>How safe do you feel in your daily life?</td>
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<tr>
<td>How healthy is your physical environment?</td>
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</tbody>
</table>

The following questions ask how completely you experience or were able to do certain things in the last two weeks.

<table>
<thead>
<tr>
<th>Question</th>
<th>1 Not at all</th>
<th>2 A little</th>
<th>3 Moderately</th>
<th>4 Mostly</th>
<th>5 Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have enough energy for everyday life?</td>
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<tr>
<td>Are you able to accept your bodily appearance?</td>
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<tr>
<td>Have you enough money to meet your needs?</td>
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<tr>
<td>How available to you is the information that you need in your day-to-day life?</td>
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<tr>
<td>To what extent do you have the opportunity for leisure activities?</td>
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<tr>
<td>How well are you able to get around?</td>
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</tbody>
</table>
### Block 7

The following questions ask you to say how good or satisfied you have felt about various aspects of your life over the last two weeks.

#### Q36

<table>
<thead>
<tr>
<th>1 Very dissatisfied</th>
<th>2 Dissatisfied</th>
<th>3 Neither satisfied nor dissatisfied</th>
<th>4 Satisfied</th>
<th>5 Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>How satisfied are you with your sleep?</td>
<td></td>
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<tr>
<td>How satisfied are you with your ability to perform your daily living activities?</td>
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<tr>
<td>How satisfied are you with your capacity for work?</td>
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<tr>
<td>How satisfied are you with yourself?</td>
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<tr>
<td>How satisfied are you with your personal relationships?</td>
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<tr>
<td>How satisfied are you with the support you get from your friends?</td>
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<tr>
<td>How satisfied are you with the conditions of your living place?</td>
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<tr>
<td>How satisfied are you with your access to health services?</td>
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<tr>
<td>How satisfied are you with your transport?</td>
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</tbody>
</table>

### Block 8

How often do you have negative feelings such as blue mood, despair, anxiety, depression?

- Never
- Seldom
- Quite often
- Very often
- Always
Below are statements about life that people often feel differently about. Please check a box to show how much you think each one is true for you. Give your own honest opinions... There are no right or wrong answers!

<table>
<thead>
<tr>
<th>Most of my life gets spent doing things that are meaningful</th>
<th>0 Not at all true</th>
<th>1 A little true</th>
<th>2 Quite true</th>
<th>3 Completely true</th>
</tr>
</thead>
<tbody>
<tr>
<td>By working hard you can nearly always achieve your goals</td>
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<tr>
<td>I don't like to make changes in my regular activities</td>
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<tr>
<td>I feel that my life is somewhat empty of meaning</td>
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<tr>
<td>Changes in routine are interesting to me</td>
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<tr>
<td>How things go in my life depends on my own actions</td>
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<tr>
<td>I really look forward to my daily activities</td>
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<tr>
<td>I don't think there's much I can do to influence my own future</td>
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<tr>
<td>I enjoy the challenges when I have to do more than one thing at a time</td>
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<tr>
<td>Most days, life is really interesting and exciting for me</td>
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<tr>
<td>It bothers me when my daily routine gets interrupted</td>
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<tr>
<td>It is up to me to decide how the rest of my life will be</td>
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<tr>
<td>Life in general is boring for me</td>
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<tr>
<td>I like having a daily schedule that doesn't change very much</td>
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<tr>
<td>My choices make a real difference in how things turn out in the end</td>
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<td></td>
</tr>
</tbody>
</table>
Thank you for taking the time to complete this survey. Your responses are greatly appreciated and will remain confidential.

Please click the arrow below for your answers to be recorded.

Add Block

End of Survey

Survey Termination Options...
REFERENCES


29. Grgurinovic T, Sindik J. Application of the mental toughness/ hardiness scale on the sample of athletes engaged in different types of sports. Phys Cult. 2015;69(2):77-87. doi:10.5937/fizkul1502077g


