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Effect of Kinesiophobia on Return to Play of Athletes at Bridgewater College

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Introduction

The biopsychosocial model was introduced by George Engel in 1977. It grew out of the biomedical model, which only focused on the "biology" of health and disease and not other factors, like the psychology and social aspects. The biopsychosocial model, also known as the integrative model, focuses on three factors influencing health and disease: biology, psychology, and sociology. To fully understand the biopsychosocial model, we must know the distinction between disease and illness. According to Turk et al., "disease is an objective biological event that involves disruption of specific body structures or organ systems caused by pathological, anatomical, or physiological changes" (2011, p. 16). Illness is "a subjective experience or self-attribution that a disease is present" (Turk et al., 2011, p. 16). Illness can cause physical discomfort, emotional distress, behavioral limitations, and psychosocial disruption. The biopsychosocial model focuses on illness due to the complex interaction of biological, psychological, and social variables (Turk et al., 2011, p. 16).

Biological variables include biological systems, including endocrine, circulatory, respiratory, and lymphatic. It includes tissue repair, the sleep cycle, neurochemistry, and nutrition (Brewer et al., 2002). "Biological variables may initiate, maintain, and modulate physical perturbations" (Turk et al., 2011, p. 17). Psychological variables include affect, behavior, and cognition (Brewer et al., 2002). "Psychological variables influence appraisals and perception of internal physiological signs" (Turk et al., 2011, p. 17). More about the psychological variables that affect an athlete's return to play in sport will be discussed later. Social variables include two subgroups: sociodemographics and social/contextual factors. Sociodemographics include age, gender, sexual orientation, race, ethnicity, and socioeconomic status. Social/contextual factors include social support, life and work stress, and situational

characteristics (Brewer et al., 2002). “Social variables shape patients’ behavioral responses to the perceptions of their physical perturbations” (Turk et al., 2011, p. 17). Integration of every variable can be shown in many different ways across each dimension. Psychological variables can affect biological variables by causing differences in hormone production and brain structure and its processes. Behavioral variables can also affect biological variables (Turk et al., 2011). For example, an athlete does not perform a particular movement for a fear of getting injured or reinjured.

"Models that fall under the biopsychosocial umbrella have proven particularly useful in advancing the understanding of cases where pain seems to be incongruous with the extent of tissue damage and where it persists in the absence of identifiable tissue damage or organic pathology" (Asmundson et al., 2004, p. 6). One of these models includes the Fear Avoidance Model of Chronic Pain, which was first introduced as the Fear Avoidance Model by Lethem and colleagues in 1983 and fully expanded to the current name by Vlaeyen and colleagues in 1995 (as cited in Gatchel et al., 2016, p. 38). Lethem and colleagues wanted to explain the process of pain and sensory components involving pain, and when the two stopped working with each other and began to occur non-simultaneously. The current Fear Avoidance Model of Chronic Pain was composed not only of the ideas of Vlaeyen and colleagues but also of the writings of McCracken et al. (1992), Waddell et al. (1993), and Asmundson et al. (1999; as cited in Asmundson et al, 2004). "Waddell et al. focused specifically on pain-provoking activities whereas Asmundson et al. suggest that fear of pain-provoking activities may be secondary to fear of anxiety-related sensations associated with pain episodes" (Asmundson et al., 2004, p. 9). In 2000, Vlaeyen and Linton captured the main ideas of the Fear Avoidance Model of Chronic Pain:

1. When pain is perceived, a judgment of the meaning or purpose of the pain is placed in the experience.

2. For the majority of individuals, the pain is judged to be undesirable and unpleasant, but not as catastrophic or suggestive of a major calamity. In this case, the individual engages in appropriate behavioral restriction followed by the graduated increases in activity until healing has occurred.
3. For a significant minority of individuals, a catastrophic meaning is placed on the experience of pain. Catastrophizing, influenced by predispositional and current psychological factors, leads to pain-related fear and thereafter spirals into a vicious and self-perpetuating fear-avoidance cycle that promotes and maintains activity limitations, disability, and pain (as cited in Asmundson et al., 2004, p. 9-10).

The Fear-Avoidance Model of Chronic Pain, in short, describes events after pain that are threatening to the individual. The model breaks down into fear and avoidance, hence the name. “Fear is the anticipatory emotional response to imminent threat” (Vlaeyen et al., 2016, p. 1588). There are many examples that display fear like going through a haunted house and the target of the scare freezes or runs from the fearful stimulus or someone being scared to swim in a deep pool because they are not a strong swimmer. “Avoidance behavior is [an undisguised] or [disguised] behavior that prevents or postpones the encounter with an aversive stimulus” (Vlaeyen et al., 2016, p. 1588). Avoidance behavior can include someone avoiding a food that they did not like or made them sick or someone avoiding roller coasters because of an article they read online. Once this avoidance behavior is acquired, it is persistent and can interfere with life. The most studied measure of the Fear Avoidance Model of Chronic Pain is the Tampa Scale for Kinesiophobia. The TSK was developed for individuals with chronic pain to evaluate fear associated with movement, physical activity, and reinjury (Hsu et al., 2017), known as kinesiophobia. Kinesiophobia is the "fear of movement and activity resulting from a feeling of vulnerability or reinjury" (Gatchel et al., 2016, p. 39). It is the primary psychological construct of the Fear Avoidance Model. Kinesiophobia is seen not only in older adults with chronic pain but also in athletes.

"One of the most emotionally devastating things that can happen to an athlete is to experience a serious injury" (Lattimore, 2017, p. 13). About 3 to 7 million sports-related injuries occur annually in the United States (Hsu et al., 2017). Most athletes enter an identity tunnel, meaning that the athletes identity revolve around their sport and who they are within the sport (Lattimore, 2017). Those who identify as an athlete struggle more following injury. "Injury often facilitates a sense of loss, negative emotions, mood disturbances, a fear in the athletes, and for some athletes, an injury takes away compensation and consequently increase life-stress and decrease overall wellbeing" (Lattimore, 2017, p. 13). Athletes can perceive injury in three different ways: 1) some view the injury as a disaster, 2) some see the injury as an opportunity to show courage and perseverance, and 3) some see the injury as a relief from the toil of practice or frustration with poor performance (Lattimore, 2017). Many athletes experience psychological responses to injury. These psychological responses include cognitive, affective, and behavioral factors. Like in the biopsychosocial model, these psychological factors interact with each other. Cognitive responses to injury include interpretations of the injury, primary and secondary appraisals, and beliefs. This could include the athlete replaying the injury in their mind and how they react to the injury the second it happens. Affective responses include emotions, feelings, and mood about one’s injury. It can cause mood disturbances like sadness, anxiety, and fear. Athletes who have affective responses due to injury can be fearful of reinjuring themselves or feel depressed that they are missing out. Behavioral responses to injury include the efforts and actions the athlete takes after the injury and the activities an athlete participates in (te Wierike et al., 2013). Behavioral responses can include working hard during the rehabilitation process or not doing the movement that caused the injury.

Kinesiophobia is the main focus of the Fear Avoidance Model. Even though the Fear Avoidance Model focuses on people who suffer from chronic pain, athletes who report fear of reinjury show symptoms of this model and exhibit elevated kinesiophobia (Hsu et al., 2017). According to Hsu et al., "…the underlying reason for elevated kinesiophobia in athletes may not be pain related because pain levels are often low at the time of return to sport. Reinjury anxiety is a related psychological construct that is not emphasized in fear-avoidance models for chronic pain development" (2017, p. 162-163). Lattimore conducted a study in which she observed an athlete, Keith, throughout his injury recovery. She found that the longer the injury recovery and rehabilitation took, the longer Keith experienced mood disturbance and compromised well-being. She also found that Keith's biggest fear was reinjury (2017). Many athletes experience fear of reinjury, like Keith, once they return to sport. Some face the injury head-on and do not develop kinesiophobia, while other athletes allow the injury to control them and affect their identity as an athlete.

Methods

Participants

A total of 60 current Bridgewater College athletes, male (n=35) and female (n=25), participated in this study. Participants ranged from 18 to 22 years of age (mean=19.7). Participants were athletes from many different sports including football (n=8), track and field (male, n=8; female, n=4), cross country (male, n=3; female, n=1), soccer (male, n=9; female, n=4)), lacrosse (male, n=9; female, n=4), swimming (male, n=2; female, n=7), volleyball (n=2), field hockey (n=1), and women’s golf (n=2). Some athletes (n=5) were multisport athletes, meaning they played more than one sport at Bridgewater College.

Procedures

After approval of the study from the Institutional Review Board at Bridgewater College, recruitment emails were sent to every coach at Bridgewater College at the beginning of February. The email provided information on what the study was, why the study was being conducted, contact information if coaches had any questions, and the questionnaire athletes needed to take. The athletes who took the survey did it voluntarily and were anonymous. Before starting the questionnaire, athletes came across a page that explained what kinesiophobia was, the purpose of the research, what questionnaires were included within the survey, the risks and benefits to participants, a confidentiality statement, a voluntary participation statement, and the contact information of the researcher. By clicking "I agree" to the first question of the questionnaire, consent was obtained from participants. Participants were asked their age, their sport, and if they ever had an injury while playing their sport. If athletes answered no (n=12) to being injured, the survey was submitted and were removed from the data for analysis as they did not fit the criteria for the study. If athletes answered yes to being injured, they continued through the survey and specified their injury.

Measures

Tampa Scale for Kinesiophobia. The TSK and the shortened version, TSK-11, were used initially to evaluate fear associated with movement, physical activity, and reinjury in chronic pain populations. However, it has also been used to assess kinesiophobia in athletes with ACL reconstruction, midshaft tibia and fibula fractures, Achilles tendon ruptures, and elbow injuries (Hsu et al., 2017). The TSK contains 17 items, each scored on a 4-point Likert scale, with 1 being 'strongly disagree' to 4 being 'strongly agree' (Weermeijer & Meudlers, 2018). Some examples of questions from the TSK include *Pain always means I have injured my body* and *I*

am afraid I might reinjure myself accidentally. Before assessing scores, questions 4, 8, 12, and 16 have to be inversely scored (Vlaeyen et al., 1995). Once these questions are inverted, kinesiophobia can be scored. Scores range between 17 and 68, with 17 representing no kinesiophobia, 18 to 37 indicating low levels of kinesiophobia, and scores greater than 37 indicating high levels of kinesiophobia (Bränström & Fahlström, 2008).

Return to Sport After Serious Injury Questionnaire (RSSIQ; Podlog & Eklund, 2005). The RSSIQ "evaluates the cognitive, affective, and behavioral aspects of the athlete's return-to-sport outcomes and measures whether fear of injury has interfered with performance since returning to sport" (Hsu et al., 2017, p. 163). The RSSIQ is a 15-item questionnaire and is measured using a 7-point Likert scale, with 1 being 'does not correspond at all' and 7 being 'corresponds exactly'. Two sub-measurements within the RSSIQ are Return Concerns (i.e., *Within my first season since returning to sport after injury, my belief in myself has been lower),* which represent questions 1-10, and Renewed Perspective (i.e., *Within my first season since returning to sport after injury, my motivation for sport success has been greater*) which represents questions 11-15. Each sub-measurement is averaged. A low Return Concern is represented by 1, while a high Return Concern is represented by 7. Similarly, a low Renewed Perspective is represented by 1, while a high Renewed Perspective is represented by 7 (Podlog & Eklund, 2005).

Data Analysis

Data analysis was conducted using IBM SPSS Statistics (Version 27). A bivariate correlation was conducted to determine if there was a correlation between kinesiophobia and age, kinesiophobia and Return Concerns, kinesiophobia and Renewed Perspective, age and Return Concerns, age and Renewed Perspective, and Return Concerns and Renewed Perspective.

Descriptive statistics were conducted on all variables, including the average level of kinesiophobia of male and female athletes, Return Concerns of male and female athletes, and Renewed Perspective of male and female athletes. Descriptive statistics were also used to determine how many athletes had no, low, or high levels of kinesiophobia.

Results

Male athletes had an average kinesiophobia score of 36.39, which puts the score in the low kinesiophobia range. Female athletes had an average kinesiophobia score of 40.35, which puts the score in the high kinesiophobia range (see Figure 1). The average RSSIQ-RC score for males was 3.66 and the average RSSIQ-RP was 5.10. The average RSSIQ-RC score for women was 4.21 and the average RSSIQ-RP score was 4.69 (see Figure 2).

Figure 1

Average Kinesiophobia Scores for Male and Female Athletes

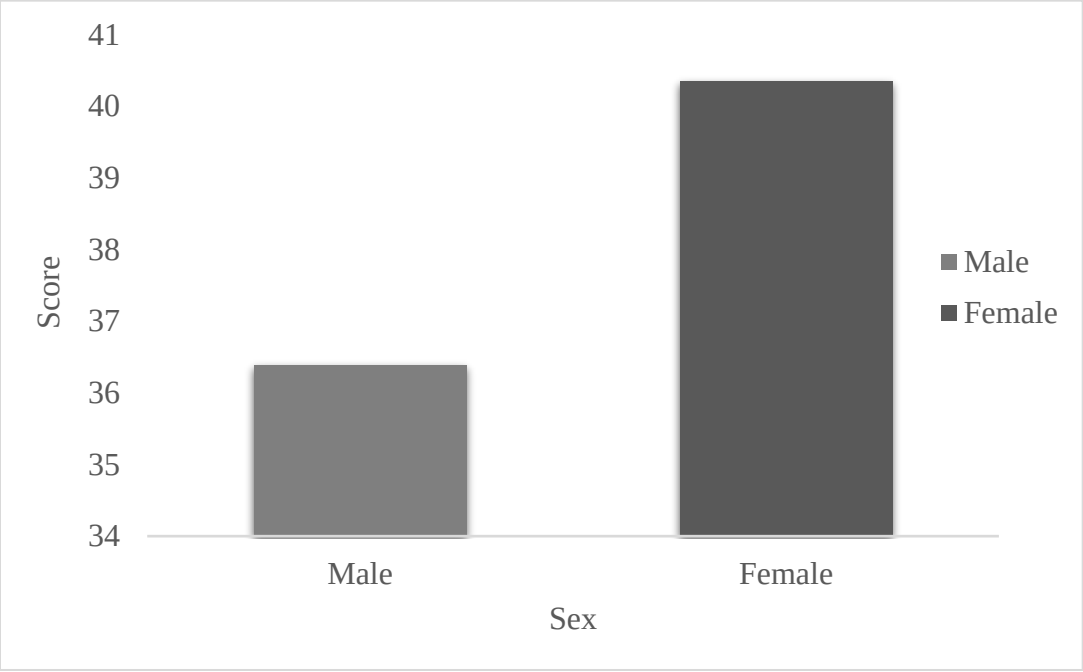

Figure 2

Average RSSIQ-RC and RSSIQ-RP Scores for Male and Female Athletes

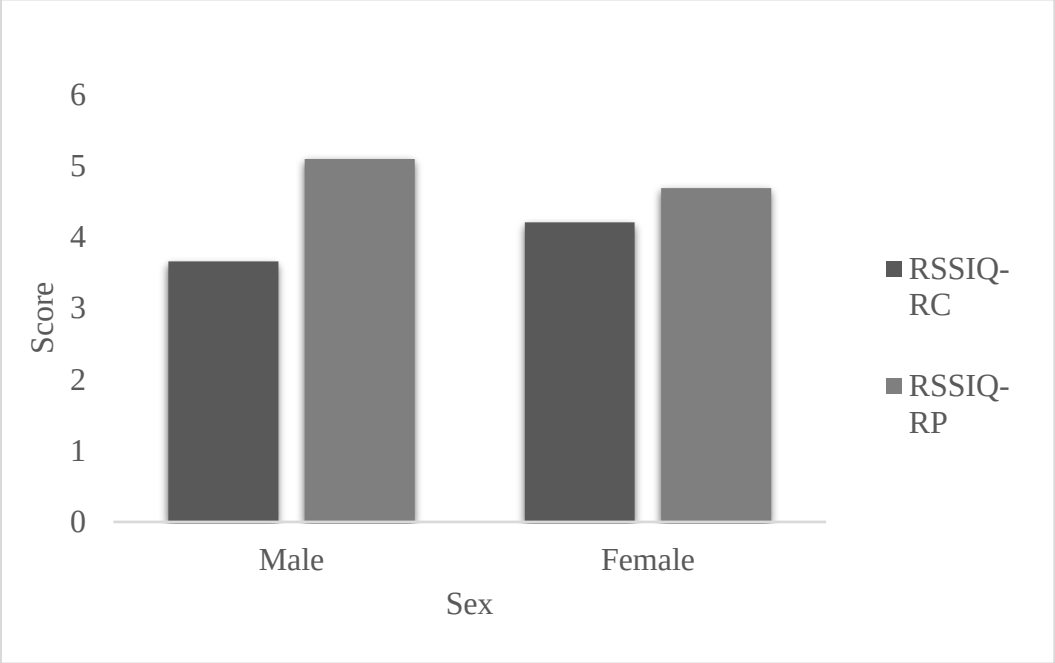

Table 1

Correlation of Age, Kinesiophobia Score, RSSIQ-RC, and RSSIQ-RP in Female Athletes

		Age	Kinesiophobia Score	RSSIQ-RC	RSSIQ-RP
Age	Pearson Correlation	1	-.252	.211	.093
	Sig. (2-tailed)		.329	.415	.722
	N	17	17	17	17
Kinesiophobia Score	Pearson Correlation	-.252	1	.314	-.115
	Sig. (2-tailed)	.329		.220	.659
	N	17	17	17	17
RSSIQ-RC	Pearson Correlation	.211	.314	1	.004
	Sig. (2-tailed)	.415	.220		.989
	N	17	17	17	17
RSSIQ-RP	Pearson Correlation	.093	-.115	.004	1
	Sig. (2-tailed)	.722	.659	.989	
	N	17	17	17	17

The correlation between age, kinesiophobia score, Return Concerns, and Renewed Perspective for male and female athletes were analyzed. For female athletes, age and kinesiophobia score have no correlation, along with age and Return Concerns, and age and Renewed Perspective. The mentioned measurements are also not statistically significant with age. Kinesiophobia score and Return Concerns have no correlation, along with kinesiophobia score and Renewed Perspective. The mentioned measurements are not statistically significant with kinesiophobia score. Return Concerns and Renewed Perspective have no correlation with each other. The data for these two measurements are not statistically significant (see Table 1).

Table 2

Correlation of Age, Kinesiophobia Score, RSSIQ-RC, and RSSIQ-RP in Male Athletes

		Age	Kinesiophobia Score	RSSIQ-RC	RSSIQ-RP
Age	Pearson Correlation	1	.028	-.154	-.125
	Sig. (2-tailed)		.882	.409	.503
	N	31	31	31	31
Kinesiophobia Score	Pearson Correlation	.028	1	.467**	-.125
	Sig. (2-tailed)	.882		.008	.505
	N	31	31	31	31
RSSIQ-RC	Pearson Correlation	-.154	.467**	1	-.012
	Sig. (2-tailed)	.409	.008		.951
	N	31	31	31	31
RSSIQ-RP	Pearson Correlation	-.125	-.125	-.012	1
	Sig. (2-tailed)	.503	.505	.951	
	N	31	31	31	31

**. Correlation is significant at the 0.01 level (2-tailed).

For male athletes, age had no correlation with kinesiophobia score, Return Concerns, or Renewed Perspective and each of these were not statistically significant. Kinesiophobia Score had no correlation with Renewed Perspective and the mentioned measurement was not

statistically significant. There was a positive correlation between Kinesiophobia Score and Return Concerns and the data was statistically significant with a p value of 0.008 and Renewed Perspective and the previously mentioned were not statistically significant. Return Concerns and Renewed Perspective had no correlation and were not statistically significant (see Table 2).

Discussion

This study aimed to investigate the relationship between kinesiophobia and return to sport. Results from this study show that for female athletes, kinesiophobia does not affect return to sport outcomes (Return Concerns and Renewed Perspective). Age is also not a factor in determining kinesiophobia for female athletes. Female athletes experienced higher levels of kinesiophobia (n=13) than low levels of kinesiophobia (n=4), with the highest recorded score being 49 and the lowest recorded score being 20. In male athletes, kinesiophobia does not affect Renewed Perspective but does affect Return Concerns. The results show a positive correlation between kinesiophobia and Return Concerns, meaning that as the kinesiophobia score increases, Return Concerns increase. Age is not a factor in determining kinesiophobia for male athletes. Male athletes experienced more low levels of kinesiophobia (n=17) than high levels of kinesiophobia (n=14), with the lowest recorded score being 22 and the highest recorded score being 55.

The possible reason why female athletes experience higher levels of kinesiophobia is that females, in general, are more prone to generalized anxiety, especially females between the ages of 15 and 54 (Faravelli et al., 2013; Wittchen & Hoyer, 2001). The results from the National Comorbidity Survey and the German National Health Interview and Examination Survey, Mental Health Supplement, support this claim. In 2001, the National Comorbidity Survey surveyed 8000 people. It used DSM-III-R criteria to determine how many males and females had generalized

anxiety disorder. The NCS found that 3.6% of men and 6.6% of females had GAD over a lifetime. It also found that over 12 months, 2% of males and 4.3% of females were diagnosed with GAD. Also done in 2001, the German National Health Interview and Examination Survey, Mental Health Supplement, was given to 7200 people. It met DSM-IV criteria to determine how many males and females were diagnosed with GAD over 12 months. The survey found that GAD was less prevalent than in America; however, the claim that females experience more generalized anxiety than men was still supported, with 1% of males and 2.1% of females displaying GAD (Wittchen & Hoyer, 2001).

The Gonadic Theory can explain the reasoning behind why females experience higher levels of anxiety. The Gonadic Theory explains that hormone levels in females fluctuate more than in men, which can affect brain regions involved in mood and behavior (prefrontal cortex and hippocampus). To explain how the theory works, Faravelli and colleagues state that "the recurrent estrogen withdrawal would interfere with the ability of estrogens to neutralize the effects of glucocorticoids released during stress, rendering women more vulnerable to stress and hence at risk for anxiety…" (2013, p. 1302). Another theory Faravelli and colleagues discuss is that boys and girls share different environmental risk factors, including childhood activities and psychosocial and economic factors. Still, Faravelli and colleagues insist that The Gonadic Theory is the likely cause of why females experience more anxiety than males (Faravelli et al., 2013).

In 2019, Correia and Rosado completed research on male and female athletes to determine anxiety levels during competition. They explained that female athletes experience higher levels of competitive trait anxiety, cognitive anxiety, and somatic anxiety, while male athletes experience high levels of concentration disruption (Correia & Rosado, 2019). The

concentration disruption of male athletes could describe why male athletes experienced higher levels of Return Concerns when experiencing high levels of kinesiophobia. Concentration disruptions can include anything from difficulty focusing to intrusive thoughts and worries. These intrusive thoughts and fears can impact the athlete and cause higher return concerns as they proceed through the return to play process.

The end of the questionnaire had a textbox that asked if an athlete had any additional comments about their injury. A total of 19 athletes talked more about their injuries. A common theme among these athletes was they showed aspects of the Fear-Avoidance Model. The model states that avoidance behavior stems from the fear of pain, ultimately resulting in kinesiophobia, the primary psychological construct of the Fear-Avoidance Model (Gatchel et al., 2016). Multiple athletes stated they let the fear of the painful stimulus impact how they viewed their sport. Many athletes said they no longer do the movement that caused the injury, like cutting after tearing an ACL or heading a soccer ball because of multiple concussions. The previous examples demonstrate behavioral responses associated with the Fear-Avoidance Model.

Many athletes experienced cognitive, affective, and behavioral responses toward their injuries. Cognitively, athletes experienced relays of their injuries days after the injury and during the return to play process. Multiple athletes talked about how they would replay the memory of the injury when they first returned to sport. Some athletes also felt that their coaches were not taking their injuries seriously. One track and field athlete said, “My coach kind of brushed my major injury aside and said it was more mental than it was physical…it was three stress fractures in my spine….” A women’s soccer player expressed that she felt she lacked support from coaches during her second meniscus replacement, which made her want to quit. Athletes also experienced affective responses to their injuries. A women’s lacrosse player said that she felt

depressed while injured and felt like she was being left out of her sport. In addition, athletes expressed how their injury hurt their confidence to perform. One athlete said that he felt stuck while the rest of his team was able to do the things he could not.

Similar to participants in Lattimore's Keith Study, athletes allowed their injury to control them. One men's lacrosse player states, "[Because of] my concussion, I was more afraid of getting injured when a ball was tossed in the air…especially if it was near me." However, many athletes faced their injury head-on and realized how meaningful their sport was to them. One track and field athlete talked about how even though he was afraid to hit his head again, the injury made him realize how much passion he had for his sport. His response lines up with his kinesiophobia score (32) and Renewed Perspective (6.2); however, he did have high Return Concerns (6.5) even though he had low kinesiophobia.

Lattimore says that athletes can perceive injury in three different ways: 1) some view the injury as a disaster, 2) some see the injury as an opportunity to show courage and perseverance, and 3) some see the injury as a relief from the toil of practice or frustration with poor performance (2017). Multiple athletes who took the questionnaire displayed the first. They saw their injury as a life changing event, which then hurt their performance during the rehabilitation process as well as after return to play. One athlete stated, "It made me notice that we truly never heal…," showing that he accepted his injury as a disaster. Some athletes showed the second way to perceive an injury. Many athletes showed, even after return to play, that they learned to enjoy the sport more. One athlete expressed his perseverance to return to lacrosse and that he would practice the movements he could everyday so he could stay in shape. His actions aided him in the return to play process and showed that he would do whatever it takes to play his sport. No athletes indicated the third way to perceive injury.

Throughout the survey, many athletes showed that the pain from the injury was not the reason for their kinesiophobia, it was the psychological toll that came along with the injury. This supports Hsu and colleagues assumption that elevated kinesiophobia is not caused by pain levels, it is caused by psychological factors (2017). Multiple athletes experienced a sense of loss, negative emotions, and mood disturbances. This could be due to athletes entering an identity tunnel. Once an athlete is injured, they do not know what to identify as. Their entire identity revolves around sport, so as an athlete is injured, they experience an identity crisis (Lattimore, 2017). Many athletes who took the questionnaire experienced identity crises, as they experienced depression and a sense of loss after their injury.

Practical Implications

Kinesiophobia in athletes needs to be decreased as it can cause mental challenges and, for some, cause an athlete to quit the sport they have worked so hard at. Kinesiophobia in athletes could be reduced by implementing psychological skills training (PST) in rehabilitation programs. Athletes, specifically college and professional, have a sport psychologist on staff that could implement PST as the athlete goes through the return to play process. According to the American Psychological Association, psychological skills training is “a program of instruction and practice in the use of relaxation, concentration, imagery, goal setting, and energizing to enhance athletic performance” (n.d.). There are multiple techniques of PST, each one being different from the next.

Progressive muscle relaxation (PMR) involves tensing the muscle one muscle group at a time for a specific time. Tensing usually occurs for 5 seconds and relaxation for 30 seconds. PMR is often used with visual imagery, which will be discussed later. As an athlete proceeds through PMR, the breaths are paid attention to. Mastery of PMR requires regular practice, and

when executed correctly, it can benefit physiology. Many athletes use a script or tape recording to guide them through PMR (Mahoney & Chapman, 2004). Biofeedback involves electrical monitoring of physiological states, including heart rate, pulse, skin response, and muscle tension. As athletes gain feedback on physiological responses, athletes will learn to obtain control over the responses. Biofeedback has to occur in multiple sessions, as it takes time to gain control. Over time, athletes can manipulate their physiology, positively affecting arousal and anxiety (Mahoney & Chapman, 2004). Meditation involves deep breathing and adds mental focus through thought or image. As athletes meditate, they focus on relaxing through deep breathing and clearing the mind of mental chatter. Meditation must be regularly practiced to achieve as it takes patience and is time-consuming. Having a set time and place helps beginners practice meditation as well as having the sessions for only 10 to 20 minutes (Mahoney & Chapman, 2004).

Part practice is another form of psychological skills training. It involves three components: segmentation, fractionation, and simplification. Segmentation is where a complex task is divided up into several basic dimensions. For example, as a gymnast goes through rehabilitation for an injury, the athletic trainer may take the athlete through different dimensions of doing a bar routine. The athletic trainer may split the bar routine into the mount, actions performed on the bar, and dismount. Each dimension is trained separately and can be chained together as time passes. Fractionation is where an athlete trains separate pieces of a complex action that occur simultaneously (Mahoney & Chapman, 2004). For example, a baseball player who had elbow or shoulder surgery would go through throwing mechanics as they gain strength in their elbow or shoulder. Each “step” of throwing is broken up and practiced. Simplification involves breaking down complex behaviors into simpler versions. The difficulty increases as an

athlete gets better at each version (Mahoney & Chapman, 2004). For example, a softball player may start hitting off a tee, then short toss, then soft toss, and ultimately from a pitcher.

Mental imagery and mental rehearsal can help an athlete struggling with an injury. Mental imagery involves a series of relevant sensations being described in detail, including sights, sounds, and smells. Images can be seen externally (i.e., an athlete seeing themselves from a third-person point of view) or internally (i.e., an athlete seeing themselves from a first-person point of view). For example, an injured athlete can see themselves in the third person performing the action that caused the injury, but successfully and without pain. Imagery can be specific (i.e., imagining performing a skill) or general (i.e., imagining themselves competing confidently). Injured athletes could use specific or general imagery by imagining themselves performing the action that caused the injury successfully (specific) or seeing themselves perform the action that caused their injury confidently (general) (Mahoney & Chapman, 2004).

The mentioned PST techniques can benefit an athlete's return to play outcome. PST can positively impact anxiety, especially in athletes with kinesiophobia. All athletes are different, so a specific PST technique may work on one athlete but not another. PST can be implemented to help athletes decrease their anxiety about reinjury as they work through rehabilitation with an athletic trainer, coaches, and/or sport psychologists.

Limitations

Many limitations occurred throughout the research process. The first is sport type and coaches response. Every athletic team was emailed the questionnaire; however, less than half of the sports teams responded. Coaches would also forward the email to their athletes, and some or

all would not respond. This goes into the second limitation, sample size. Bridgewater College is relatively small, so a sample size of 60 participants is large. However, the sample size is insignificant compared to bigger colleges and universities. If this research were performed again, a questionnaire to all colleges and universities in the area (Bridgewater College, James Madison University, Eastern Mennonite University, Blue Ridge Community College, and Mary Baldwin University) would be sent out to attempt to gain a larger sample. The last limitation was time. This research was done in four months; however, there was a lot of waiting. IRB approval took ten days the first time and four days the second time. Data was then obtained for a month. If there was more time for the research, more effects on return to play could be covered.

Conclusion

Kinesiophobia does not affect return-to-play outcomes in female athletes and affects return concerns in male athletes. Psychological skills training can be implemented to aid injured athletes in reducing anxiety and possibly help decrease kinesiophobia. As research continues on this topic, the gender differences in the results should be examined, predominantly female athletes, because most participants have a high level of kinesiophobia. Future research could include the gender discrepancies of anxiety and could possibly explain why female athletes had more kinesiophobia than male athletes.

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