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DEPRESSION IN STUDENT ATHLETES: A PARTICULARLY AT-RISK GROUP? A SYSTEMATIC REVIEW OF THE LITERATURE

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ABSTRACT

Mental health initiatives are being implemented based on collegiate athletes being a high risk subculture for a variety of health behaviors that correlate directly to depression. This literature review used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method to investigate the association between depression and student athletes. An initial search of the research databases yielded 807 articles. After applying additional delimiting criteria, 30 articles were considered relevant for the critical review and 11 for the systematic review. Results showed that student athletes are actually less likely to be depressed when compared to their non-athlete peers due to protective factors including levels of self-esteem and confidence, social support, and connectedness. However, there were distinct differences among collegiate athletes in how depression

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manifests and factors that serve as barriers to treatment. It is important for coaches, parents, teachers, peers, and those working with athletes to be able to recognize factors that may influence depression among this population as well as barriers that may instigate the adoption of risky health behaviors and inhibit them from seeking help.

Keywords: athlete, college, student, depression, mental health, sports

INTRODUCTION

At the college level, students have convenient access to health and counseling services offered on campus; however, only 20% of students with mental health problems seek professional help (Michael, Huelsman, Gerard, Gilligan, & Gustafson, 2006). In addition, collegiate athletes tend to underutilize campus health services even more so than their non-athletic peers. According to the American Psychological Association (2014), depression is: "a lack of interest and pleasure in daily activities, significant weight loss or gain, insomnia or excessive sleeping, lack of energy, inability to concentrate, feelings of worthlessness or excessive guilt and recurrent thoughts of death or suicide" (para. 1). The stigma of "being depressed" or "seeing a counselor" is often considered a "weakness" by the athletic subculture. Athletes are trained to be both physically and mentally tough; therefore, feelings of hopelessness, loneliness, and lack of self-worth are viewed as personal flaws, but in reality, are symptoms of depression which can effectively be treated. The National Collegiate Athletic Association (NCAA, 2005) has recognized that the increased stress placed on student-athletes and their high risk behaviors are significantly associated with depression and therefore implemented a campaign on managing student-athletes' mental health issues (Etzel, Watson, Visek, & Maniar, 2006). In fact, according to the NCAA, suicide was the third-leading cause of death of student athletes from 2004-08, after accidents and cardiac arrests (NCAA, 2005). In 2010, suicide also rose to the third leading cause of death among all young adults ages 18-24 (Centers for Disease Control and Prevention [CDC], 2014). Depression is a disparaging health problem for all young adults, but what is unique about the student athlete is the pressure he/she may feel to perform even under distress. As told to Noren (2014), "One in every four to five young adults has mental health issues, but what is unique about the student athlete is they have stressors and expectations of them unlike other students that could either trigger a psychological concern or exacerbate an existing mental health issue" (para. 5).

According to the National Athletic Trainers Association (NATA, 2013), the probability of having college athletes on campus with some form of mental illness is a virtual certainty. Therefore, it is vital to develop improved strategies for identification, diagnosis, prevention, and outreach for this population. The primary aims of this review are to systematically examine the literature comparing depression in student athletes versus non-athletes, and critically examine the influential factors distinctive to student athletes. Strategies for prevention and intervention will also be discussed.

METHODS

According to the statement of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009), we systematically

searched published peer-reviewed studies that investigated the association between depression and student athletes in the following electronic databases: Academic Search Complete, CINAHL Plus with full text, ERIC, Health Source, Google Scholar, MEDLINE, Pub Med, Psychinfo, Soc Index with full text, SportDiscus and Alt. Healthwatch. Search terms included the following, individually and in combination: 'athletes', 'college athletes', 'intercollegiate athletes', 'elite athletes', 'student athletes', 'sports', 'depression', 'major depressive disorder', and 'depressive symptoms'. Although the target population was student athletes, we retrieved all papers (N = 807) addressing athletes and depression, from the adolescent to elite level, including brief case reports and thesis papers.

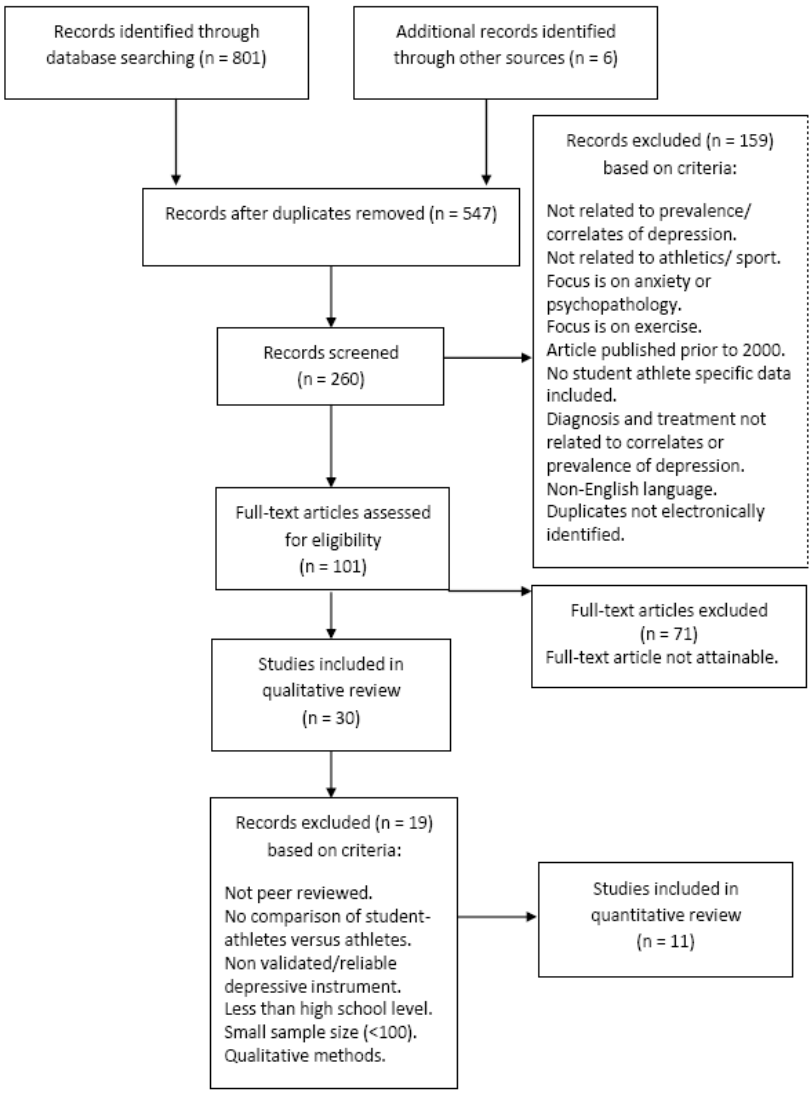

Figure 1. PRISMA Flow Diagram.

As shown in Figure 1, 807 records were screened. Inclusion criteria for the selection of articles included in the critical review were those articles that focused on correlates of

depression in student athletes, published after 2000, and available as full text articles in the English language. Exclusion criteria for the critical review were as follows: articles published prior to 2000, not available in English, articles about anxiety or psychopathology and not about prevalence or correlates of depression, articles about exercise in general and not athlete or sport specific, and duplicates that were not identified electronically. In total, 30 articles were retained for inclusion in the main body of the critical review of distinct differences among collegiate athletes in how depression manifests and factors that serve as barriers to treatment.

The systematic review applied the aforementioned inclusion criteria as well as the following: a comparison of depression in student athletes versus non-athletes at the high school level and beyond assessed by using a valid and reliable instrument that screened for depressive disorders and/or assessed depressive symptom severity, and peer reviewed. Included instruments were defined as symptom severity scales if the response scale asked 'how much' or the frequency of symptoms; screening instruments were defined as those that screened for a specific mental disorder and/or if cutoff scores were provided to indicate the need for further evaluation. Exclusion criteria for the systematic review were studies with small sample sizes (less than 100 participants) and qualitative studies. The authors are aware that comparisons cannot be drawn between different studies and samples. This is why Table 1 is presented that reports the samples and measures used in 11 studies that specifically evaluated depression among student athletes versus non-athletes in the quantitative review.

RESULTS

There were two outcomes of this paper: 1) to systematically review the studies that specifically compared depression in student athletes versus non-athletes (11 papers total meeting inclusion in the quantitative review) and 2) to critically review the distinct differences among collegiate athletes in how depression manifests and factors that serve as barriers to treatment (30 papers total meeting inclusion criteria in the qualitative review).

Depression among Student Athletes versus Non-Athletes

College athletes represent a highly diverse population that is very widely visible on campuses. It has been noted that athletes, unlike their non-athlete peers, are very closely watched by their coaches, their fellow peers, university compliance officers as well as the media. At the collegiate level, athletes have daily athletic performance pressures, hectic travel schedules, injuries, media, and social pressures that are unique when compared to their non-athlete counterparts (Etzel et al., 2006; Johnson & Ivarsson, 2011). Therefore one would think that this unequal level of pressure could put athletes at increased risk for depressive symptomatology. However, numerous studies, as highlighted in Table 1, have demonstrated high school athletes and beyond are less likely to present symptoms of depression when compared to their non-athlete peers (Armstrong & Oomen-Early, 2009; Backmand, Kaprio, Kujala, & Sarna, 2001; Backmand et al., 2003; Backmand et al., 2009; Brand et al., 2010; Chioqueta & Stiles, 2007; Dishman et al., 2006; Schaal et al., 2001; Storch, Storch, Killiany, & Roberti, 2005; Taliaferro, Rienzo, Miller, Pigg, & Dodd, 2008; Wyshak, 2001).

Table 1. Summary of Research Findings Relating to Depression and Student Athletes

Authors	Subjects	Sports	Psychological Instrument	Depression	Conclusions
Armstrong & Oomen-Early, 2007	Male and female NCAA Div. I college student-athletes (N = 104) Male and female college non-athletes (N = 123)	Team and Individual	Center for Epidemiologic Studies Depression Scale	Lower Higher	Athletes had significantly lower levels of depression than did non-athletes.
Backmand et al., 2001	Former "elite" male athletes who represented Finland from 1920-1965 (N = 1,040) Middle and old age male controls who were classified as healthy at 20 years of age (N =7 77)	Endurance, Power/ Combat, Team Sports	BSI-53	Lower Higher	Differences regarding depression were statistically significant; controls were more depressed than endurance sport and team sport athletes. No differences were found with regards to anxiety.
Backmand et al., 2003	Former "elite" male athletes who represented Finland from 1920-1965 (N = 664) Middle and old age male controls who were classified as healthy at 20 years of age	Endurance, Power/ Combat, Team Sports	BSI-53	Lower Higher	Physical activity had a protective effect against depressiveness however physical activity had no significant association with anxiety. Very high physical activity had a significant protective effect against depression.
Backmand et al., 2009	Former "elite" male athletes who represented Finland from 1920-1965 (N = 509) Middle and old age male controls who were classified as healthy at 20 years of age controls (N = 349)	Endurance, Power/ Combat, Team Sports	BSI-53	Lower Higher	There was a high-risk for onset of depression among those with a history of combat sports (e.g., boxers/wrestlers) compared to controls. Those with history of team sports are less depressed than controls. Physical inactivity at baseline predicted the highest risk for future depression.

Table 1. (Continued)

Authors	Subjects	Sports	Psychological Instrument	Depression	Conclusions
Brand et al., 2010	Male and female "Swiss Olympic Class" student-athletes (N = 258) Male and female high school non-athletes (N=176)	Team and Individual	The Depression Scale	Lower Higher	Compared to controls, athletes had lower scores for depressive symptoms and trait anxiety.
Chioqueta & Stiles, 2007	Army and University active sport participants (N =9 6) Army and University students (N = 90)	Unknown	The (depression) Symptom Checklist 90 Revised (SCL-90-R) The Beck Hopelessness Scale	Lower Higher	Active engagement in sport was significantly associated with lower levels of hopelessness and depression.
Dishman et al., 2006	12th grade girls from South Carolina (N = 1,250)	Team and Individual	Center for Epidemiological Studies Depression Scale (CES-D)		Athletes reported less frequent feelings of depression than non-athletes.
Schaal et al., 2011	French High Level and Junior Athletes (N = 2067) Prevalence data across population studies	Team and Individual	Retrospective psychological evaluations	Lower Higher	Lower depression rates were found within higher sport level.
Storch et al., 2005	Male and female NCAA Div. I college student-athletes (N = 105) Male and female college non-athletes (N = 293)	Team and Individual	Social Anxiety Scale for Adolescents		Female athletes had higher depression scores compared to male athletes and male and female students. Male athletes had lower depression scores compared to male and female students.
Taliaferro et al., 2008	High school sport participants (N = 3281) High school no sports (N = 3609)	Team and Individual	2005 Youth Risk Behavior Survey	Lower Higher	Sport participation was significantly associated with reduced odds of hopelessness and suicidal behavior among both genders.
Wyshak, 2001	Former female university athletes (N = 2,622) Former females university non-athletes (N = 2,776)	Team and individual	Rand Mental Health Inventory (RMHI-5)	Lower Higher	Age-adjusted percent of physician-diagnosed depression (lifetime) was significantly lower in former athletes than non-athletes.

Several of these studies (Armstrong & Oomen-Early, 2009; Brand et al., 2010; Storch et al., 2005) looked specifically at the college student population whereas the other studies looked either at elite athletes, such as Olympic level, or at high school athletes. Regardless of the age of the athlete the findings were still the same. Athletes reported lower rates of depressiveness than non-athletes. And, lack of physical activity early on in life (before 20 years of age) predicts higher rates of depression later in life (after 68 years of age) (Backmand et al., 2003).

Several researchers have linked this lower rate of depression to a student athlete's level of self-esteem. For example, sport participation among female students contributes to higher self-esteem (Richman & Schafffer, 2000) and those involved in interscholastic sports are most likely to report high self-esteem and least likely to report sadness, anxiety, and suicidal behavior (Armstrong & Oomen-Early, 2009; Taliaferro et al., 2008; Wyshak, 2001). In one longitudinal cohort study, it was reported that team-sport athletes, in particular, have less risk of depression due to a higher level of self-confidence when compared to individual-sport athletes (Schaal et al., 2001).

Sport participation has also been linked to positive social bonds and relationships. At the high school level, athletes interact with coaches on a daily basis and these relationships often become surrogate parent relationships or at the very least role model relationships. This positive interaction with an adult could explain the decreased likelihood of depression. Additional findings show that sports provide the student athlete with additional interactions with peers and professionals, which allow them to develop a stronger a social network than their non-athlete peers (Miller & Hoffman, 2009; Harrison & Narayan, 2003). Social relations among people who share common interests strengthens bonds and support (Chioqueta & Stiles, 2007), as dually noted by Armstrong & Oomen-Early (2009) who found college athletes to have greater levels of perceived social connectedness than non-athletes. Overall, this review suggests that athletes report less depressive symptoms than non-athletes, but they are also less likely to seek help than non-athletes (Michael, Huelsman, Gerard, Gilligan, & Gustafson, 2006), increasing the risk of suicide. Such conclusions make college athletes distinct with regard to depression beyond related, influential factors.

Distinctive Depression Symptomology of Collegiate Athletes

Even though the prevalence of depression is less likely among athletes when compared to non-athletes in the same age group, it has been established that young adulthood represents a vulnerable emotional time relative to other points in the lifespan (Hurr, 2011). However, even within this broad scope of mental illness, there are distinct differences among athletes in how depression manifests, especially among traditional college-aged athletes. Not only do they have sport-specific challenges including the physical and mental demands of practice and competition, time constraints due to sport related schedules, increased scrutiny, and proportionately more of their identity as a young adults tied to their roles as athletes, but collegiate athletes are considered a "high-risk" sub-population on American college campuses for a variety of health behaviors including: alcohol use and abuse, eating disorders, overtraining, and the stressors of injuries (Etzel et al., 2006; Noren, 2014; NATA, 2013). Many of these variables have been shown to correlate directly to depression. Barriers to treatment for mental illness may also be athlete-specific, including increased feelings of

shame, and fear of a negative impact on social status should they seek common support services such as counseling (NATA, 2013).

Alcohol Use

Participation in athletics has repeatedly been associated with increased levels of alcohol use (Adams et al., 2013; Brenner & Swanik, 2007; Gutgesell, Moreau, Thompson, 2003; Nelson & Wechsler, 2001; Vickers et al., 2004; Grossbard et al., 2007). Researchers report that male athletes binge drink at a rate 16% higher and females at a rate 19% higher than non-athlete male and female students (Brenner & Swanik, 2007). Furthermore, athletes consume less alcohol during the competitive season; 56% of college athletes binge drink outside of the competition season compared to 35% who binge drink during the season (Grossbard et al., 2007).

More athletes than non-athletes experience alcohol-related harms and consequences such as destructive behavior, risky sex, including drinking before or during sex and having sex with multiple partners, and academic problems (Adams et al., 2013; Nelson & Wechsler, 2001; Grossbard et al., 2007). Researchers found that athletes who participated in team-sports consumed more alcohol and exhibited greater alcohol risk behaviors than those athletes who participated in individual-sports, which may stem from psychological aspects of group dynamics, modeling, team bonding, and sport psychology (Adams et al., 2013; Brenner & Swanik, 2007).

While researchers have reported higher rates of binge drinking and alcohol use among athletes, whether this risk taking is due largely to depression is inconclusive. In fact, increased likelihood for social gatherings, modeling behaviors, and the need to bond with team members may play a large role. Educators, administrators, coaches, researchers, and those involved with college health should consider these factors when planning prevention efforts, policy, interventions, and future studies. However, it is important to note that overall life satisfaction is a risk factor for alcohol use and none of the research studies mentioned above measured or controlled for this. Future research examining use of alcohol among athletes versus non-athletes should also include measures of life satisfaction and depressive symptoms in order to clarify reasons for alcohol use further.

Eating Disorders

Not only is alcohol use and abuse more common among collegiate athletes, but eating disorders are also more widespread, especially among female athletes and athletes participating in sports most impacted by weight status (Gutgesell et al., 2003; Chatterton & Petrie**,** 2013; Reinking & Alexander, 2005). Female collegiate athletes experience the same societal pressures to be thin, lose weight, and be more aesthetically appealing as their non-athletic peers, but additionally, collegiate athletes are often either internally or externally pressured to maintain a certain weight for peak performance. Chatterton & Petrie (2013) found that U.S. male collegiate athletes who were engaged in weight-class sports were more likely to be symptomatic and engage in pathogenic eating and weight control behaviors compared to endurance sport or ball game athletes. Athletes appear to be at increased risk not

only due to factors within the sport environment, but also because they frequently possess traits that are common among individuals with eating disorders (e.g., perfectionism, need for achievement, ability to withstand pain, and discomfort) (Chatterton & Petrie). Disordered eating can negatively affect every aspect of a collegiate athlete's life, often leading to a lack of concentration in academics, athletic underachievement, social withdrawal, and feelings of sadness, irritability, and hopelessness. Depressive symptoms have been documented to be strongly associated with disordered eating (Mazzeo & Espelage, 2005); therefore, if athletes are indeed at increased risk of eating disorders then athletes could naturally be at increased risk for depression.

Overtraining

Intense and prolonged practice and competition schedules often result in a syndrome called "overtraining." Signs and symptoms of overtraining include: exhaustion, sleep disturbances, lowered self-esteem, appetite fluctuations, irritability or anxiety, weight loss, lack of mental concentration and motivation, immune suppression, delayed physical recovery, and decreased performance (France, 2004). Sanders, Field, Diego, & Kaplan (2000) studied hours of sports involvement on depression levels. High school students that were classified as "high sports involvement" (seven or more hours per week), had more symptoms of depression than low (two or less hours) to moderate (three to six hours per week) sports involvement respondents. The researchers concluded that high levels of sports participation led to overtraining and depression is one of the cardinal signs of overtraining in athletes. Psychological, physiological, and physical symptoms of overtraining correlate directly to, and are sources of, depression.

Coping with Injury

The prevalence of injury varies depending on the sport or activity, but generally the injury rate is about 14 per 1000 competition hours and 4 per 1000 hours of training. In fact, more than half of athletes will sustain some type of injury during sport participation (Appaneal, Levine, Perna, & Roh, 2009). At the time of injury, and during the recovery and rehabilitation process, recreational and competitive athletes may be at increased risk of depressive symptomatology relative to the general population (Appaneal et al., 2009; Tracey, 2003; Wadey, Evan, Evans, & Mitchell, 2001; Kebede & Rao, 2013; Mainwaring, Hutchison, Bisschop, Comper, & Richards, 2010; Yang, Peek-Asa, Lowe, Heiden, & Foster, 2010; Ameri, Zeidabadi, & Ehsani, 2012; Van Wilgen, Kaptein, & Brink, 2010; Ligon, 2012; Brewer, Cornelius, Stephan, & Van Raalte, 2010).

Within this context, however it can be normal for athletes to have an emotional response to an injury including feelings of loss, anger, and frustration but these typical responses to an acute injury which are followed by adjusting to the injury, viewing it as a manageable challenge and an associated positive attitude towards their injury and the related rehabilitation process (Tracey, 2003). Researchers have noted that in athletes, some severe injuries can trigger a grief response that can progress through stages including a cognitive assessment of how the injury took place and other variables such as continual assessment of the severity of

injury (Walker, Thatcher, & Lavallee, 2007). Perceived loss, feelings of bereavement and physical illness are risk factors for depressive symptomatology (National Institute of Mental Health, 2013). Depression is positively associated with an injury, especially if the student's self-image revolves around his or her identity as a collegiate athlete. In fact, an athlete's physical health status is often related specifically to overall self-esteem (Walker et al., 2007). In a study of 72 athletes with sports-related injuries, Mayo Clinic found that injured athletes displayed heightened symptoms of depression. More profound symptoms of depression were associated with the severity of injury, level of impaired sports performance, and lack of social support (Manuel et al, 2002).

Researchers have found that although acute injury and the associated recovery increases an athlete's vulnerability to depressive symptomatology and negative mood states, not all injured athletes incur negative emotional health impacts post injury (Wadey et al., 2001). In fact, some athletes perceive the injury positively as a stimulus for increased resiliency or a welcome respite from practice and competition. Researchers do agree that one of the factors that distinguish injured athletes from non-athletes is the high degree of variability among athlete's perceptions of the injury and subsequent development of depressive symptomatology (Kebede & Rao, 2013; Tracey, 2003).

Risk factors associated with depressiveness post injury among athletes have been identified including intrinsic factors such as personality traits (Yang et al., 2010) and extrinsic factors including the type and severity of the injury (Ameri et al., 2012). These traits have been assessed among athletes via scores of "factor A" (reserved or outgoing) and "factor I" (tender-minded or tough-minded) from commonly used personality factor questionnaires. For example, increased prevalence and severity of depressive symptoms have been observed among athletes who had lower baseline pre-injury levels of self-esteem and coping skills, higher levels of perceived stress, and personality traits characterized as "reserved" as opposed to "outgoing" (Kebede & Rao, 2013). A suggestion that "tough minded" athletes fared better relative to risk for injury as well as post injury compared to "tender minded" athletes was bolstered by the suggestion that the loss of exercise and physical activity as a chronic coping mechanism was among underlying factors (Kebede & Rao). The type and severity of the injury has also been associated with the prevalence as well as the severity of depressive symptomatology in injured athletes (Mainwaring et al., 2010). For example, athletes with knee injuries have increased depressive symptoms severity compared to athletes post-concussion. Additionally, longer durations of recovery post injury have been associated with more negative emotional health consequences.

Among surprising observations and sub-topics within the context of athletes, injury, and depression is the possibility that injury can enhance mental and emotional states at the same time that negative emotional consequences of injury are taking place (Wadey et al., 2001; Tracey, 2003; Thatcher, Kerr, & Day, 2007). This has been examined specifically to gain understanding of an apparent paradoxical relationship. In fact, researchers have not only identified some positive emotional outcomes of injury but also argue that positive effects take place simultaneously with negative effects such as enhanced hardiness and resiliency with depressed mood states (Thatcher et al.; Tracey). Positive impacts observed among injured athletes include increased empathy, enhanced ability to explore non-athletic pursuits, and increased time management skills and these positive emotional responses have been associated with increased likelihood of returning to the sport sooner at the pre injury level (Ardern, 2012). Results from an associated study of injured young male athletes found

enhanced emotional control, increased knowledge of injury risk factors, enhanced network of peers, increased free time, academic performance, and enhanced strength and conditioning as cited benefits of the injury (Walker et al., 2007; Thatcher et al.). Additionally, researchers have observed a potential protective mechanism in a reduction of athletic identity among injured athletes (Brewer et al., 2010). Also compelling, it has been observed that for athletes who find that sport participation is a source of acute and chronic emotional stress, the injury was viewed as a positive release from a lifestyle perceived as burdensome and outside of the athletes control (Kebede & Rao, 2013; Brewer et al., 2010; Wadey et al.).

Injured athletes represent a distinct yet varied group of individuals relative to depression and other negative emotional consequences of injury. Researchers have observed relevant differences between athletes and non-athletes as well as differences between athletes in the identification of risk factors for injury related depression, assessment of mental and emotional illness, and treatment including the identification of possible benefits of injury. These are important observations and trends that can be explored further for the benefit of the injured athlete.

Increasing Awareness and Referrals: A Need for Health Education and Promotion

Given the stigma that prevents athletes from actively seeking help (NATA, 2013; Hurr, 2011; Tracey, 2003), there is a pressing need to help anyone working with athletes to recognize signs of depression and to refer athletes to mental health professionals who can properly diagnose and assist with treatment. Typically depression is assessed clinically via reporting of symptoms or with commonly used scales and surveys. Researchers have suggested that combining these two approaches in repeated fashion during diagnosis and treatment phases may yield the most relevant information about the patient athlete and optimally direct treatment and services. In fact, repeated measures of clinical interview data combined with survey scores among 165 young male and female athletes at one week, one month, and three months revealed specific trends that could potentially direct care (Appaneal et al., 2009). Associations between the severity of the injury and depression were similar to other studies, but new observations included relationships between depression and the time post injury; with depression decreasing as time post injury increased as well as an increased risk of depression identified for females post injury. In addition, the NATA (2013) suggests that athletic departments could improve early intervention by including questions about mental health history on their yearly physical forms. Physicians could discuss symptoms with the athlete at the time of examination, and if they detect any potential concerns, they refer them to qualified clinical counselors at the university or elsewhere.

Relative to seeking support, researchers have observed differences among collegiate athletes in their selection of support systems pre and post injury. Knowledge of these differences may make family, friends, coaches, and allied health providers more aware of some shifts in their roles pre and post injury (Yang et al., 2010). Specifically more than 90% of athletes report primarily relying on their family and friends for support pre injury. Additionally, the satisfaction among athletes with these support providers is high. Post injury, significant shifts in support sources are observed with athletes relying less on family and friends (reduced by 11% and 23% respectively) and more on athletic trainers, coaches, and

physicians. In fact, athletes reporting of athletic trainers as their primary support system increased by 212% among athletes post injury compared to pre injury (Yang et al.).

Given this shift in support systems sought by athletes, the influence of coaches is examined. Researchers argue that athletes, regardless of injury status, perceive their coaches as either having a positive or negative influence on them (Ligon, 2012). Negatively viewed coaches are perceived as lacking in understanding, setting goals for the athletes that are not attainable, or applying unnecessary pressure on the athlete. Given that social factors such as isolation influence an athlete's perception of their injury as well as their recovery, researchers examined athlete perception of coaches' attitudes and behavior among 151 male and female collegiate athletes. Of the 151 athletes, 47 males were injured and 37 females were injured. The scales included two sub categories relative to climate: task involving and ego involving. A task involving climate is characterized by coaches motivating athletes to exert effort, make progress, and collaborate. An ego involving climate is characterized by coaches motivating athletes by delivering punishment, fostering inequities, and rivalry among teammates. Behaviors of coaches assessed in the questionnaires included perceived lack of concern, coach direct involvement, coach support of pain, and coach pressure to play. Researchers observed significant differences between the two team climates relative to perceived behaviors among coaches. Task involving climates were associated with higher levels of concern, coach direct involvement, support of pain, and decreased pressure to play. Alternatively, injured athletes in ego involving team climates perceived that coaches cared less, were not directly involved in rehabilitation, were less supportive of athlete's pain, and pressured the athletes to return to play (Ligon). Prevention programs which focus on recognizing the signs of depression, reducing stigma, offer coping techniques, providing role models (such as athletes who have experienced depression and are willing to talk about their recovery) and improving the climate for referral could reduce the shame and silence among athletes and lead to earlier intervention and treatment.

CONCLUSION

Results from this systematic review demonstrate that collegiate athletes are less likely to be depressed than non-athletes due to factors such as higher self-esteem and stronger social networks. However, the empirical evidence also suggests that student athletes are less likely to seek help which may put them at an increased risk for suicide, now the third leading cause of death in young adults between the ages of 18-24 (CDC, 2014). There is a need expressed in the literature to address student athletes as a unique subgroup on college campuses in terms of prevention, interventions and care for those exhibiting symptoms of depression.

A theme emerging from the critical review is that student athletes experience unique stressors from non-athletes, including: the physical and mental demands of practice and competition, time constraints due to sport related schedules, increased scrutiny, stigma associated with injury or failure, pressures about weight status, and proportionately more of their identity as a young adults tied to their roles as athletes (Chatterton & Petrie**,** 2013; NATA, 2013). Furthermore, while student athletes may report less depression or symptoms of depression than their non-athlete peers, athletes are more likely to engage in certain risk-taking behaviors than there non-athlete peers, such as: binge drinking, substance abuse, disordered eating, overtraining, and performing while injured (Etzel et al., 2006; Noren, 2014;

NATA, 2013). Many of these behaviors positively correlate with depression; however, to what extent this risk taking and unhealthy behavior among student athletes is caused by depression is inconclusive and requires further investigation.

Another consistent finding from the literature is that injury may serve as an enabling and protective factor against depressive symptoms. Researchers agree that one of the factors that distinguish injured athletes from non-athletes is the high degree of variability among athlete's perceptions of the injury and subsequent development of depressive symptomatology (Kebede & Rao, 2013; Tracey, 2003). Injured athletes represent a distinct yet varied group of individuals relative to depression and other negative emotional consequences of injury. In fact, the literature supports a paradoxical relationship. For some athletes, injury may be an escape from acute and chronic emotional stress stemming from the perceived pressure of sport participation (Kebede & Rao; Brewer et al., 2010; Wadey et al., 2001). Injury may also increase feelings of empathy, control, resiliency and hardiness (Thatcher et al., 2007; Wadey et al.). Factors such as personality traits, duration of recovery, levels of self-esteem pre-injury, and type of sport influence positive or negative associations with depressive symptoms (Ameri et al., 2012; Brewer et al., 2010; Kebede & Rao; Mainwaring et al., 2010; Wadey et al.; Yang et al., 2010).

Given the stigma that prevents athletes from actively seeking help (NATA, 2013; Hurr, 2011; Tracey, 2003), there is a pressing need to help anyone working with athletes to recognize signs of depression and to refer athletes to mental health professionals who can properly diagnose and assist with treatment. However, researchers have observed differences among collegiate athletes in their selection of support systems pre and post injury. Pre injury, athletes report relying more on family and friends, while post injury, athletes rely more on their athletic trainers, coaches, and physicians. Knowledge of these differences may make family, friends, coaches, and allied health providers more aware of some shifts in their roles pre and post injury (Yang et al., 2010). For example, NATA (2013) suggests that athletic departments could improve early intervention by including questions about mental health history on their yearly physical forms. Parents may also communicate with coaches and physicians about their child's emotional health and well-being. At yearly physical evaluations, physicians could discuss symptoms with the athlete at the time of examination, and if they detect any potential concerns, they refer them to qualified clinical counselors at the university or elsewhere. Likewise, post injury, physicians, coaches, and athletic trainers could initiate discussion with the injured athlete and their family or caregivers about the athlete's emotional health and refer the athlete for additional follow-up with a counselor or psychologist as warranted. Based on this review of the literature, and in addition to the NCAA's campaign to heighten awareness about helping athletes manage mental health needs, we also recommend the development of more tailored awareness interventions for groups within an athlete's social support network (e.g., fellow athletes, friends, family, coaches, trainers, teachers, health practitioners).

Educators, athletic directors, researchers, sport psychologists, and those involved with college health should consider factors including stigma, social networks, coaches' influence, and improving climate when planning prevention efforts, policy, interventions, and future studies. However, the research is still limited and there have not been any large, systematic studies with rigorous methodology on depression in athletes. Limitations in the existing literature include depression being measured with various depressiveness scales. These instruments are widely used and have been deemed to be valid and reliable screenings for

depressive disorders and assessing depressive symptom severity; the instruments are not, however, diagnostic of clinical disease. Furthermore, the various scales limit the comparison of results, and lead to variability in the estimates of depression. Another limitation is that most of the data collected were self-reported by students. No social desirability scales were included to control for response biases. On the other hand, self-report instruments are frequently utilized to identify the possible presence of a depression disorder or to assess the severity of symptoms and therefore, serve an in important service to alert the health professional to the need for further clinical evaluation or treatment. More research is needed in the areas of prevalence, risk factors, prognosis and the unique experiences facing athletes with regard to depression. In addition, overall life satisfaction is a risk factor for the high risk behaviors of athletes and few studies mention, measure, or control for this. Future research should include measures of life satisfaction and depressive symptoms in order to control for such variables and assess the effectiveness of prevention efforts and their impact on help-seeking.

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