

The Prevalence of Failure-Based Depression Among Elite Athletes

Thomas Hammond, MSc,* Christie Gialloreto, MSc,† Hanna Kubas, BSc,‡ and Henry (Hap) Davis IV, PhD§

INTRODUCTION

Objective: To assess the prevalence of diagnosed failure-based depression and self-reported symptoms of depression within a sample of elite swimmers competing for positions on Canadian Olympic and World Championship teams.

Design: A cross-sectional design.

Setting: Assessments were conducted after the conclusion of the qualifying swimming trials.

Participants: The sample consisted of 50 varsity swimmers (28 men and 22 women) based at 2 Canadian universities who were competing to represent Canada internationally.

Main Outcome Measures: Diagnosed depression was assessed using a semistructured interview, and symptoms of depression were also assessed by the Beck Depression Inventory II. Performance was measured by changes in swimming time and athlete ranking.

Results: Before competition, 68% of athletes met criteria for a major depressive episode. More female athletes experienced depression than their male peers ($P = 0.01$). After the competition, 34% of athletes met diagnostic criteria and 26% self-reported mild to moderate symptoms of depression. The prevalence of depression doubled among the elite top 25% of athletes assessed. Within this group, performance failure was significantly associated with depression.

Conclusions: The findings suggest that the prevalence of depression among elite athletes is higher than what has been previously reported in the literature. Being ranked among the very elite athletes is related to an increase in susceptibility to depression, particularly in relation to a failed performance. Given these findings, it is important to consider the mental health of athletes and have appropriate support services in place.

Key Words: diagnosed depression, prevalence, failed performance, elite athletes

(*Clin J Sport Med* 2013;23:273–277)

Submitted for publication September 5, 2012; accepted January 14, 2013.

From the *Faculty of Health, School of Psychology, Deakin University; †Westmount Consulting, Calgary, Alberta, Canada; ‡Department of Psychology, University of Calgary, Calgary, Alberta, Canada; and §Swimming Canada, Calgary, Alberta, Canada.

The authors report no conflicts of interest.

Corresponding Author: Henry Davis IV, PhD, Suite 354, 401-9th Ave SW, Calgary, AB T2P 3C5, Canada (hapdavis@gmail.com).

Copyright © 2013 by Lippincott Williams & Wilkins

Depressive disorders are the most prevalent psychological disorder where approximately 17.7% of the population will develop this condition at some point during their life.¹ Given the pervasiveness of depression, the severity of consequences on an individual's well-being, and ability to function, this area in psychology has received much attention in the general population. Similarly, there has been a growing interest in recent years related to the mental health of athletes.²

Despite this interest, very few epidemiological studies have been conducted examining the psychopathology of athletes.² It has been proposed that the main reason for this is due to the widespread assumption that only emotionally and mentally strong athletes are able to compete at the highest levels of elite sport. As such, psychological disorders do not exist amid these elite performers.³ Other studies have suggested that athletic participation was a marker for decreased instance of depression and suicidal ideation.^{4,5} However, the majority of evidence examining elite athletes indicates that depression occurs at a similar or increased frequency as within the general population,⁶ with female athletes reporting 1.32 greater odds of experiencing symptoms of depression² and higher levels of depressive symptoms when compared with male athletes.⁷

It has been hypothesized that managing academics, maintaining health, recovering from injury, facing retirement, coping with success, and managing performance expectations and anxiety are all potential stressors pertinent to elite athletes.^{7,8} Although numerous pressures confront them, failure in competition is one form of stressor that seems to increase susceptibility to negative affect and depressive disorders.^{9–11} It is a common occurrence for elite athletes to experience negative affect and depressive symptoms after failing during competition. When performance goals are not achieved, failure-based negative affect and depression is a distinct possibility. Within one elite sample, 80% of failed athletes had experienced at least one 2-week period in which they displayed at least 5 depressive symptoms from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR¹²) in the year after Olympic trials.¹³ Not only does failing in competition increase the susceptibility to depression but also viewing a past personal athletic failure can induce a depressed state.⁹ The effects of game outcome (winning or losing) have also been associated with failure-based depressive symptoms. After a loss, there was a significant increase in depressed mood, anger, and

decreased vigor, whereas after a win, athlete mood remained more positive.¹⁰

Although these studies have provided valuable information about the prevalence of depressive symptoms within a student athlete population^{2,7} and have examined failure-based negative affect based on a previous performance or team result,^{9–11} there still remains large gaps in the literature. First, there has been a reliance on self-reported measures to assess the prevalence of depression among athletes. Although some self-reported measures such as the Center for Epidemiological Studies Depression Scale¹⁴ or the Beck Depression Inventory II (BDI-II)¹⁵ are useful in assessing the presence or severity of depressive symptoms,^{16,17} they do not diagnose depression, rule out conditions with similar presentations, or assess the degree of impairment.¹⁸ To diagnose depression, an interview should be completed to determine if criteria from the DSM-IV-TR are present.^{18,19} Second, to date, no studies have been undertaken examining the relationship between individual performance results and the prevalence of diagnosed depression within a group of elite athletes.

Therefore, the first purpose of this study was to assess the prevalence of diagnosed major depressive episode within a sample of elite athletes and to explore the relationship of a failed performance to athlete depression. It was hypothesized that the prevalence of a major depressive disorder among these elite athletes would be greater than that reported for the general population. In line with previous research, it was believed that female athletes would experience greater instance of depression when compared with male athletes. The second objective was to explore the relationships between performance history and affective response. It was theorized that performing below one's potential would hold broad adverse implications for elite athletes, which may lead to the development of a major depressive episode.

MATERIALS AND METHODS

Participants

The study sample consisted of 28 male and 22 female varsity swimmers at 2 Canadian universities. All were competitors at a national level and qualified to compete at trial competitions for determining Olympic and World Championship teams. Participants were aged 18.2 to 26.7 years, with a mean age of 20.5 years. There were 5 different swimming disciplines of various distances represented, including freestyle, breaststroke, backstroke, butterfly, and individual medley.

Procedures

Upon university ethics approval, athletes were invited to participate in the study via their respective coaches and provided informed consent. Before the swimming trials, demographic information and personal best performance times were collected. Consultations to assess current and 36-month history of depressive symptoms were conducted by trained provisional psychologists, capable of making diagnoses, under the supervision of a senior clinical psychologist, using a semistructured interview. Symptoms were assessed

using the current and 36-month time point references to determine present athlete function and establish a history of depression. Athletes were also asked to complete a self-report assessment of the severity of their depressive symptoms. All athletes were assessed within 2 months after the completion of the swimming trials.

Measures

To establish the presence of a major depressive episode, a semistructured interview was conducted based on DSM-IV-TR criteria. This interview was used to elicit and evaluate depressive symptomology reported to assess severity and significance of impairment if diagnostic criteria were achieved. To receive a diagnosis of depression, an athlete must have experienced, for at least 2 weeks in duration, symptoms featuring low mood and/or the loss of desire and interests. Additionally, these symptoms must be accompanied by clinically significant changes in 4 of the following symptoms: appetite, sleep, agitation or motor slowing, fatigue or low energy, negative self-reference or guilt, concentration deficit, and suicidal risk or suicidal thinking.

The BDI-II is a 21-item self-report instrument used to assess the presence and severity of symptoms corresponding to criteria for diagnosing depressive disorders. Items are rated on a 4-point scale ranging from 0 to 3, with cutoff scores reflecting minimal (0–13), mild (14–19), moderate (20–28), and severe (29–63) depression. The BDI-II has well-established psychometric properties and has been found to be a reliable and valid screening tool for depressive symptoms.^{15,20}

Performance results were assessed on 2 variables, the actual time of the swimming performance and the effect this performance had on the athlete's national competitive ranking. Swimming performance was measured in seconds and was determined slower or faster than their personal best time. The personal best for each athlete was defined as the fastest time that athlete had ever recorded in what was deemed by the coach to be the athlete's strongest event. The time recorded at the trial competition was used as the comparison against this personal best, where the percent change was calculated as the dependent variable. A performance time slower than a personal best was considered a subpeak performance and a time faster or equal to a personal best was considered a peak performance.

The ranking of an athlete among all Canadian athletes was determined using the ranking before the qualifying competition (time 1) and the ranking after the conclusion of the competition (time 2). The change in ranking between these 2 time points was used in data analysis. For each athlete, the percent change in ranking from time 1 to time 2 was computed as the dependent variable for data analysis. Additionally, based on rankings at time 1, athletes were categorized into the top 25% of the sample ($n = 12$) (a rank between 1 and 12) and the remaining 75% of the sample ($n = 38$).

Data Analysis

Analyses were completed using SPSS version 20.0 (IBM, Armonk, New York). Descriptive statistics were then calculated for all variables assessed. Chi-square tests were used to identify differences in the prevalence of depression between

genders. Analyses of variance were conducted to identify differences in the number and severity of depressive symptoms reported between genders and ranking category. Correlations and multiple regressions examined the relationship between failed athletic performance and athlete depression.

RESULTS

Prevalence and Severity of Depression

Results demonstrated that before the swimming trials, 68% met criteria for major depressive disorder in the previous 36 months. The number of diagnostic criteria and symptoms of depression are presented in Table 1. Of the athletes who met diagnostic criteria for depression, 15 were men and 19 were women. Significantly more female athletes than male athletes met diagnostic criteria for major depression $\chi^2_1 [(n = 50) = 4.68, P = 0.01]$, and reported significantly more symptoms of depression than their male counterparts ($F_{1,20} = 6.78, P = 0.017$).

After the swimming trials, 34% of athletes met DSM-IV-TR criteria for a major depressive episode. The average number of diagnostic criteria satisfied by all participants was 3.44. The results of the BDI-II self-report measure indicated that 22% of athletes reported experiencing mild depression and 4% of athletes reported moderate depression. Correlation analyses demonstrated that there was a significant relationship between diagnosed criteria using the DSM-IV-TR and self-reported symptoms using the BDI-II ($r = 0.644, P < 0.001$).

A significant association was found between rank and athletes who met DSM-IV-TR diagnostic criteria, $[\chi^2_1 (n = 50) = 4.68, P = 0.008]$. Significantly more athletes who were ranked in the top 25% of the sample (as contrasted with the remaining 75%) met diagnostic criteria for major depression. This elite group of athletes also reported significantly more DSM-IV-TR symptoms ($F_{1,44} = 6.25, P = 0.016$), when compared with the remaining 75% of the athletes. No differences were observed in the number of BDI-II symptoms reported. Within this group, 66% met diagnostic criteria for a major depressive episode and 41% self-reported experiencing mild to moderate symptoms of depression.

Performance Results

Performance data collected after the conclusion of the qualifying events indicated that 75% of athletes swam slower than their personal best and 25% of athletes swam equal to or faster than their personal best. Significantly more women than men experienced performance failure $[\chi^2_1 (n = 50) = 5.01, P = 0.025]$. Among the top 25% of athletes, no gender differences existed. With respect to ranking, 66% of athletes experienced a negative change in ranking.

Relationship Between Performance and Depression

Correlations were calculated to assess the relationship between percent change in rank, percent difference in swimming performance, and depression. Within the entire sample, no significant relationships were observed between change in ranking, change in performance time, and any measure of depression. When the sample was limited to the top 25% of athletes, there was a significant correlation between change in swimming performance and diagnostic criteria ($r = -0.57, P = 0.03$). However, no significant relationship was found between the number of BDI-II symptoms reported and performance results.

Linear regression analyses were conducted to determine if difference between performance times, negative or positive change in rank, and 36-month history of depression were associated with current depression as measured by the DSM-IV-TR and BDI-II. The results of these analyses revealed that a significant relationship was found ($r^2 = 0.24, F_{1,48} = 14.73, P < 0.01$), where history of depression significantly contributed to current DSM-IV-TR symptoms. With respect to BDI-II symptoms, a significant relationship was found ($r^2 = 0.20, F_{3,43} = 12.29, P < 0.01$) between history of depression and current depression.

When the sample was limited to the highly elite athletes (top 25%, $n = 12$), a significant relationship was observed ($r^2 = 0.33, F_{1,10} = 4.81, P = 0.05$). Change in swimming performance was significantly related to current depression, whereas history of depression was not (Table 2). In a model to predict BDI-II symptoms, no significant relationships were observed.

TABLE 1. The Prevalence of Diagnosed Depression and Self-Reported Symptoms

Variable	Men (n = 28)	Women (n = 22)	Top 25% of Athletes (n = 12)	All Participants (n = 50)
History of diagnosed depression	15	19	8	34
Current DSM diagnosis	7	10	8	17
Average diagnostic criteria presented	2.71 (SD 2.65)	4.36 (SD 3.30)	6.88 (SD 0.99)	3.44 (SD 3.03)
BDI-II symptoms				
Minimal	23 (4.80)	14 (4.17)	7 (5.86)	37 (4.77)
Mild	4 (14.00)	7 (15.43)	4 (15.50)	11 (14.91)
Moderate	1 (22.00)	1 (22.00)	1 (22.00)	2 (22.00)
Severe	0	0	0	0

Data are reported as mean (standard deviation) scores. Average number of BDI-II symptoms is reported in parentheses. DSM, Diagnostic and Statistical Manual of Mental Disorders.

TABLE 2. Linear Regression Analyses of Performance and Depression Within Elite 25% of Sample

Variable (n = 12)	DSM Symptoms*	r ²	r ² †	B	β	F	P
Change in performance	-0.55	0.33	0.26	-1.22	-0.57	4.81	0.05‡
Change in rank	-0.27	0.08	-0.03	-0.01	-0.27	0.73	0.41
Diagnostic history of depression	0.47	0.48	0.15	0.41	0.47	2.94	0.12

*Adjusted r².

†Correlations.

‡Significant at 0.05 level.

DSM, Diagnostic and Statistical Manual of Mental Disorders.

DISCUSSION

A widespread assumption has existed within the sporting world that only emotionally and mentally strong athletes are able to complete at the highest levels. Psychological disorders, such as depression,³ were thought to infrequently occur among elite athletes³; however, data from the present study suggests otherwise. This represents one of the few studies to describe the prevalence of depression among elite athletes with the use of a diagnostic interview and to relate performance failure to depressive affect.

The prevalence of depression found in the present study was higher than the lifetime frequency reported in the general population aged 19 to 34 (17%) using diagnostic consultations¹ and higher than the 1-week prevalence estimated among intercollegiate athletes (21%) when using screening measures.² Retrospective diagnostic interviews demonstrated that 68% of athletes sampled met criteria for a major depressive episode within the previous 36 months, establishing a much larger number of athletes who experienced a depressive episode in their past. After the conclusion of international qualifying competitions, it was observed that 34% of all athletes met criteria for a major depressive episode, whereas 26% of athletes self-reported mild to moderate symptoms of depression. In part, this result of greater prevalence than what is generally reported may have been due to the use of a diagnostic interview rather than sole reliance on self-reported measures. As stated in previous research, self-reported measures are vulnerable to biases in reporting symptoms and limit the ability to determine if athletes were experiencing clinically significant distress.^{2,7,18} Despite this methodological difference, it is not surprising that elite athletes are at an increased risk for depressive disorders. Today's elite athletes are faced with immense physical, social, and psychological pressures.³ Constant challenges such as demanding schedules, pressures to perform, media scrutiny, and failure on the world stage would undoubtedly take their toll and may manifest in a form of psychopathology.

Consistent with previous results on gender and the prevalence of depression,^{2,7,21} the present study found that significantly more female than male athletes met diagnostic criteria for a major depressive disorder in the past 36 months. Although this significant relationship was not found after the swimming trials, it can be argued that in this preliminary sample, the female athletes were not as competitively strong and were more likely to fail than their male peers. As such, performance expectations of the women in our sample may

have been lower providing some protection from a failed performance. However, it seems that there are factors that predispose women to experience depression at an increased rate when compared with men. Some researchers have suggested that biological and social variables contribute to their increased risk of depression, including different social roles and societal attention toward women in sport.^{22,23} One hypothesis proposed that female athletes may be exposed to a greater number of stressors and may internalize the stressful situations differently, resulting in greater distress.²⁴

Furthermore, research has demonstrated that female athletes perceive themselves having less social support than their nonathlete peers, which may reduce their ability to cope with distress and increase their vulnerability to depression.⁷ One final possible explanation for the distinction in female depression is that female athletes are generally more willing to seek help and report their symptoms.²³ Regardless of the hypothesis, further research is required to understand why female athletes are at an increased risk of depression. Given this knowledge, screening procedures and support systems should be developed to specifically meet the needs of female athletes.²⁵

When the sample was limited to the highly elite athletes within the top 25%, the prevalence almost doubled to 66% of athletes meeting DSM-IV-TR criteria and 41% of athletes reporting mild to moderate symptoms. It is suggested that the higher prevalence rate was due to the enhanced personal significance of failure. The results of the competition seemed to have a profound effect on the mood and well-being within the top 25% of performers. The results of the regression analyses demonstrated that change in performance time was significantly associated with current levels of depression. Therefore, if the athletes swam slowly, this resulted in a poor performance and in turn they experienced higher levels of depression. These findings are logical given that a failed performance would be more meaningful to someone ranked in the top 5 with a legitimate chance of qualifying. Furthermore, a failed performance would have significant implications not only on team selection and sport funding but also on the individual's identity as an athlete.

Similar findings have also shown that when performance goals are not achieved, depressive symptoms are a distinct possibility.^{10,11} Approximately 80% of athletes who failed during their athletic performance during the Olympic Games experienced a major depressive episode.¹³ After a loss or a tied game, female premier league soccer athletes displayed a significant increase in symptoms of depression after

the conclusion of the match.¹¹ A failed performance has also been related to increased anger, depression, and reduced vigor.¹⁰

Although this study is one of few to assess the prevalence of depression among elite athletes with the use of a diagnostic assessment, there were several limitations. The present design consisted of a small group of 50 elite swimmers based at 2 Canadian universities. Given the small sample and focus on Canadian athletes from 1 sport, the findings may not be representative of all elite athletes. Additionally, this study conducted assessments after qualifying competition however did not continue to monitor athlete depression over time. It is recommended that future studies evaluate how long failure-based depressive episodes occur for and what implications the episodes have on subsequent sport performance.

In summary, the present study suggests that the prevalence of depression within this group of elite athletes is higher than what has been previously reported in the literature. Aspiring to compete among the world's best athletes may increase an athlete's susceptibility to depression, particularly in relation to a failed performance. Although failure-based depression seems to affect athletes of both genders, female athletes continue to experience depression at increased rates. Given these findings, it is important for coaches, athletic staff, and particularly team psychologists to consider the mental health of athletes and have appropriate screening, monitoring, and intervention support services in place, especially after a failed performance.

REFERENCES

1. Suvisaari J, Aalton-Setälä T, Tuulio-Henriksson A, et al. Mental disorders in young adulthood. *Psychol Med*. 2009;39:287–299.
2. Yang J, Peek-Asa C, Corlette J, et al. Prevalence of and risk factors associated with symptoms of depression in competitive college student athletes. *Clin J Sport Med*. 2007;17:481–487.
3. Markser VZ. Sport psychiatry and psychotherapy. Mental strains and disorders in professional sports. *Eur Arch Psychiatry Clin Neurosci*. 2011;261:1–4.
4. Babiss LA, Gangwisch JE. Sports participation as a protective factor against depression and suicidal ideation in adolescents as mediated by self-esteem and social support. *J Dev Behav Pediatr*. 2009;30:376–384.
5. Sanders CE, Field TM, Diego M, et al. Moderate involvement in sports is related to lower depression levels among adolescents. *Adolescence*. 2000;35:793–797.
6. Reardon CL, Factor RM. Sport psychiatry: a systematic review of diagnosis and medical treatment of mental illness in athletes. *Sports Med*. 2010;40:961–980.
7. Storch EA, Storch JB, Killiany EM, et al. Self-reported psychopathology in athletes: a comparison of intercollegiate student-athletes and non-athletes. *J Sport Behav*. 2005;28:86–98.
8. Parham W. The intercollegiate athlete. *Couns Psychol*. 1993;21:411–429.
9. Davis H, Liotti M, Ngan E, et al. fMRI bold signal changes in elite swimmers while viewing videos of personal failure. *Brain Imag Behav*. 2007;2:82–93.
10. Jones MV, Sheffield D. The impact of game outcome on the wellbeing of athletes. *Int J Sport Exerc Psychol*. 2008;5:54–65.
11. Hassmen P, Blomstrand E. Mood state relationships and soccer team performance. *Sport Psychol*. 1995;9:297–308.
12. Association AP. *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR)*. Washington, DC: American Psychiatric Association; 2000.
13. Baillie PHF, Davis H, Ogilvie B. Working with elite athletes. In: Van Raalte J, Brewer B, eds. *Exploring Sport and Exercise Psychology*. 2nd ed. Washington, DC: American Psychological Association. In press.
14. Radloff LS. The CES-D scale. *Appl Psychol Meas*. 1977;1:385–401.
15. Beck AT, Steer RA, Brown GK. *Beck Depression Inventory—Second Edition Manual*. San Antonio, TX: The Psychological Corporation; 1996.
16. Gotlib IH, Lewinsohn PM, Seeley JR. Symptoms versus a diagnosis of depression: differences in psychosocial functioning. *J Consult Clin Psychol*. 1995;63:90–100.
17. Steer RA, Ball R, Raneeri WF, et al. Further evidence for the construct validity of the beck depression inventory-ii with psychiatric outpatients. *Psychol Rep*. 1997;80:443–446.
18. Sharp L, Lipsky M. Screening for depression across the lifespan: a review of measures for use in primary care settings. *Am Fam Physician*. 2002;66:1001–1008.
19. Soleimani L, Lapidus KAB, Iosifescu DV. Diagnosis and treatment of major depressive disorder. *Neurol Clin*. 2011;29:177–193.
20. Whisman MA. Factor structure of the beck depression inventory—second edition (bdi-ii) in a student sample. *J Clin Psychol*. 2000;54:545–551.
21. Silverstein B. Gender difference in the prevalence of clinical depression: the role played by depression associated with somatic symptoms. *J Psychiatry*. 1999;156:480–482.
22. Altemus M. Sex differences in depression and anxiety disorders: potential biological determinants. *Horm Behav*. 2000;50:534–538.
23. Culbertson FM. Depression and gender. An international review. *Am Psychol*. 1997;52:25–31.
24. Storch EA, Masia-Wamer C, Brassard MR. The relationship of peer victimization to social anxiety and loneliness in adolescence. *Child Stud J*. 2003;33:1–18.
25. Rumball JS, Lebrun CM. Preparticipation physical examination: selected issues for the female athlete. *Clin J Sport Med*. 2004;14:153–160.