



**Háskólinn
á Akureyri**
University
of Akureyri

Depressive symptoms explored among athletes and university students

Athletes, non-athletes and depression

Bjarney María Bjarnadóttir
Jónína Jórunn Helgadóttir
Laufey Ása Alfreðsdóttir

**Sálfræðideild
Hug- og félagsvísindasvið
Háskólinn á Akureyri
2021**

Depressive symptoms explored among athletes and university students

Athletes, non-athletes and depression

Bjarney María Bjarnadóttir
Jónína Jórunn Helgadóttir
Laufey Ása Alfreðsdóttir

12 eininga lokaverkefni
sem er hluti af
Baccalaureus Artium-prófi í sálfræði

Leiðsögukennari/-ar/ráðunautur
Richard Eiríkur Tahtinen

Sálfræðideild
Hug- og félagsvísindasvið
Háskólinn á Akureyri
Akureyri, maí 2021

Titill: Depressive symptoms among athletes and university students
Stuttur titill: athletes, non-athletes and depression
12 eininga bakkalárprófsverkefni sem er hluti af Baccalaureus Artium-prófi í sálfræði.

Höfundarréttur © 2021 Bjarney María Bjarnadóttir, Jónína Jórunn Helgadóttir,
Laufey Ása Alferðsdóttir
Öll réttindi áskilin

Sálfræðideild
Hug- og félagsvísindasvið
Háskólinn á Akureyri
Sólborg, Norðurslóð 2
600 Akureyri

Sími: 460 8000

Skráningarupplýsingar:
Bjarney María Bjarnadóttir, Jónína Jórunn Helgadóttir, Laufey Ása Alferðsdóttir
2021, bakkalárprófsverkefni, sálfræðideild, hug- og félagsvísindasvið,
Háskólinn á Akureyri, 33 bls.

Akureyri, maí 2021

Útdráttur

Bakgrunnur: Fyrri rannsóknir hafa sýnt ósamræmi þegar það kemur að algengi þunglyndis hjá íþróttamönnum. Þrátt fyrir þetta ósamræmi hafa niðurstöður fyrri rannsókna sýnt að íþróttamenn upplifi áskoranir þegar kemur að geðheilsu. Fáar eða engar rannsóknir hafa skoðað einstök einkenni og borið saman mun hjá íþróttamönnum og háskólanemum.

Markmið: Markmið þessarar rannsóknar var að skoða mun á þunglyndiseinkennum hjá íþróttafólki og háskólanemum. Áhrifaþættirnir kyn og staða þátttakenda, þegar kemur að þunglyndiseinkennum, voru kannaðir. Skoðaður var munur á einstaka einkennum og framkvæmdur samanburður milli hópa.

Aðferðir: Þátttakendurnir í rannsókninni voru íþróttamenn (n=187) og háskólanemar (n=375). Gerð var krafa um að þátttakendur væru 18 ára eða eldri. Notast var þversniðskönnun og PHQ-9.

Niðurstöður: Í ljós kom marktækur munur milli meðaltals á heildarskori þunglyndiseinkenna. Bæði kvenkyns íþróttamenn og kvenkyns háskólafólk sýndu hærra meðaltal á PHQ-9. Háskólanemar sýndu marktækt hærra meðaltals-heildarstig samanborið við íþróttamenn. Þegar kemur að sérstökum einkennum þunglyndis, sýndu háskólanemendur svipaða dreifingu á einkennum og íþróttamenn.

Lykilorð: Þunglyndi, Íþróttamenn, háskólafólk

Abstract

Background: Earlier researches have shown inconsistencies when it comes to the prevalence of depressive symptoms in athletes. Despite these differences, the results from previous studies underline the fact that athletes do experience mental health problems. Few or no studies have explored the specific symptoms of athletes compared to non-athletes.

Aims: This study aimed to explore diversity in depressive symptoms among individual athletes and non-athletes. The role of gender and participant status was tested, as well as specific depressive symptoms with a comparison between the groups.

Methods: The participants in the study consisted of individual sport athletes (n=187) and university students (n=375), there was a criterion of being at least 18 years old. A cross-sectional survey was used, and the Patient Health Questionnaire (PHQ-9) as a measurement scale.

Results: The results showed significant gender differences in the total score of depressive symptoms, both female athletes and female students showed higher mean on PHQ-9. University students showed significantly higher total scores compared to athletes. When it comes to the specific symptoms university students showed similar distribution across the specific symptoms as athletes.

Keywords: Depression, athletes, non-athletes, university students,

Efnisyfirlit

ÚTDRÁTTUR.....	i
ABSTRACT.....	ii
INTRODUCTION.....	1
INNGANGUR.....	2
1.1 DEPRESSION.....	3
SPECIFIC SYMPTOMS/ASSESSMENT OF DEPRESSIVE SYMPTOMS.	4
GENDER DIFFERENCES.....	4
<i>RATE AND RISK FACTORS FOR DEPRESSION.....</i>	<i>5</i>
1.2 ATHLETES AND DEPRESSION.....	5
1.3 UNIVERSITY STUDENTS AND DEPRESSION.....	6
METHODS.....	8
2.1 PARTICIPANTS.....	8
2.2 MEASURES.....	8
2.3 PROCEDURE.....	9
2.4 ETHICS.....	9
2.5 DATA ANALYSIS.....	9
RESULTS.....	11
3.1 DESCRIPTIVE STATISTICS.....	11
3.2 PREVALENCE.....	11
3.3. THE EFFECT OF GENDER ON DEPRESSIVE SYMPTOM.....	12
3.4 MEAN DIFFERENCE WITHIN ATHLETES AND STUDENTS.....	12
3.5 SPECIFIC SYMPTOM COMPARISON AND ANALYSIS FOR CLINICALLY DEPRESSED ATHLETES AND STUDENTS - DEPRESSIVE SYMPTOMS FOR EACH ANSWER.....	13
DISCUSSION.....	15
4.1 LIMITATIONS.....	18
4.2 CONCLUSION.....	19
REFERENCES.....	20

Table of figures

Figure 1	12
Figure 2	13
Figure 3	14
Figure 4	15

Table of tables

Figure 1	11
-----------------------	----

1. Introduction

According to the World Health Organization (WHO), mental health is a state of well-being. Individuals realize their potential, cope with the everyday stresses of life, work productively and fruitfully, and contribute to their community (World Health Organization, 2018). One of the leading disabilities in the world affecting mental health is depression; more than 300 million people globally suffer from depression, around 4,4% of the world's population. (World Health Organization, 2020).

A study by Craft and Perna, (2004) showed that exercise may alleviate symptoms of depression. However, research by Rice, Purcell, De Silva et al. (2016) suggested that professional athletes experience a comparable risk of depression relative to non-athletes. Researches have shown inconsistencies when it comes to the prevalence of depressive symptoms in athletes compared to non-athletes; studies have reported variable prevalence rates in athletes' depressive or anxiety symptoms, varying from 6 % (Schaal et al., 2011) to 45% (Gouttebauge, Backx, Aoki, & Kerkhoffs, 2015). However, individual athletes showed to be more exposed to depression than team sport athletes in research by Nixdorf, Frank, and Beckmann (2016). Despite athletes being notably physically active, research has shown that athletes do experience mental health challenges (Wolanin, Gross, and Hong, 2015). Ibrahim,

Kelly, Adams, and Glazebrook (2012), suggest that university students are at higher risk of depression than found in the general population. Most mental health issues have the first onset by age of 24, which is a common age for university students (Hunt and Eisenberg, 2010). Professional athletes are often in a similar age group as university students, therefore university students are a reasonable group when comparing depressive symptoms in athletes.

The overall aim of this study was to explore depressive symptoms in individual athletes and university students.

1.1 Depression

In DSM–V (2013), mood disorders are classified into two groups; bipolar and related disorders with subtypes (e.g., bipolar I, bipolar II, cyclothymic disorder) and depressive disorders (e.g., major depressive disorder, persistent depressive disorder). Major depressive disorder (MDD), often referred to as depression, is the most common mood disorder. Depressive disorders include two main sub-categories: Major Depressive disorder (MDD) and dysthymia. The symptoms are similar, but dysthymia can be milder and longer-lasting, while MDD can be more intense (World Health Organization, 2017).

Depression can be clinical or subclinical. Subclinical depression is referred to as someone who has not formally met the full criteria for major depression, who presently experiences depressive symptoms that are not serious enough or persistent enough to be worth a diagnosis of major depression (Ji, 2012). Clinical depression is also referred to as MDD, so the difference between subclinical depression and clinical depression is that the subclinical is under the threshold of MDD diagnosis according to DSM-V criteria. Depression can cause reduced life quality and become a severe health condition and can lead to physical problems and decreased ability to function at home and at work, sadness and loss of interest in something once enjoyed (APA, 1994).

The symptoms criteria for Major Depression Disorder (MDD) are defined in DSM-V as the following:

Depression symptoms can vary from mild to severe and can include the following symptoms:

- Feeling sad or having a depressed mood
- Loss of interest or pleasure in activities once enjoyed
- Changes in appetite — weight loss or gain unrelated to dieting
- Trouble sleeping or sleeping too much
- Loss of energy or increased fatigue
- Increase in purposeless physical activity (e.g., inability to sit still, pacing, handwringing) or slowed movements or speech (these actions must be severe enough to be observable by others)
- Feeling worthless or guilty
- Difficulty thinking, concentrating or making decisions
- Thoughts of death or suicide

The individual must be experiencing five or more symptoms during the same 2-week period and at least one of the symptoms should be either 1) depressed mood or 2) loss of interest or pleasure (DSM-V, 2013).

Depression may emerge through a complex interplay between social, biological, and psychological factors. Difficult life events can increase the risk of developing depression. Fortunately, there are effective psychological and pharmacological treatments for depression (WHO, 2021).

Specific symptoms / Assessment of depressive symptoms

In research by Nesse and Fried (2015), it is suggested that it is important to explore specific symptoms of depression instead of only the sum score. According to Nesse and Fried (2015) the sum score could potentially mask important information about the patient. Assessing specific symptoms may increase the possibility of receiving the appropriate treatment. On screening tools like PHQ-9 it should be considered that one can receive a significant sum-score without reporting any specified number of symptoms (Fried og Nesse, 2015). Meaning that a significant sum-score only suggests that the patient show clinically relevant symptoms. A commonly used self-report measure is the nine-item patient health questionnaire PHQ-9 (PHQ-9, Kroenke & Spitzer, 2002); it is applied to evaluate the appearance of the nine depressive symptoms listed in DSM-V over a period of past two weeks (Golding et al., 2020). Exploring the specific symptoms with the sum-score can help understand the underlying problem that might be essential (Fried og Nesse, 2015).

Gender differences

As shown in a study by Breslau et al. (2017), women are more likely to develop depression than men, 2.8 times more likely at the age of 12 years old and up to 4.0 times more likely than men to develop depression at the ages of 13 to 16. Based on age- and gender-specific frequency ratios, almost 3.0 times more females (36.1%) than males (13.6%) will be exposed to first onset of depression during the ages of 12 through 17 years old (Breslau et al., 2017).

Young women are at the highest risk for MDD in general (Albert, 2015). As shown in a study by Albert (2015), before puberty women and men have almost equal depression rates but at the beginning of puberty women are at the biggest risk for major depression and mental disorders. Women are more than twice as likely to develop depression as men at the ages of 14 to 25, but that rate decreases with age (Albert, 2015). Both women and men show a decreasing

rate of depression and their prevalence becomes more equal when they reach the age of 65 (Albert, 2015). According to WHO (2015), the frequency for depression is 5.1% among females and 3.6% among males.

Rate and risk factors for depression

Depression is estimated to affect 6.7% of adults each year and 16.6% individuals experience depression at some point in their lives (American Psychiatric Association, 2013). As shown in a study by Breslau et al. (2017), the rate of depression in women is 5.7% and 2.0% in men around the age of 12. The rate reaches its highest in women aged 15 years or mean of 13.2% and highest in men aged 17 years or mean of 4.9%. The difference between the individual's gender changes by ages. The rate of depression in 12 years old is 3.7% and it is significantly greater for each age group, increasing to 8.8% in 15 years old before slightly decreasing to 5.7% at 17 years old (Breslau et al., 2017).

According to Razzak, Harbi and Ahli (2019), the main risk factors are family history of chronic diseases, financial troubles, stressed life events, and lack of social support. Being a student can increase risk for depression, mostly due to lack of support from family, financial concerns, anxiety, and stressed events (Razzak, Harbi and Ahli, 2019).

1.2 Athletes and depression

Athletes can experience a high amount of stress and pressure resulting in their mental health being exposed to mental health issues (Wolanin, Gross and Hong, 2015). It is reported in a study by (Gouttebarga, et.al., 2019) that the most common mental health disorders that athletes experience is depression (34%), mis-use of alcohol (19%), distress, and sleep disturbance. Research by Proctor and Boan-Lenzo (2010), showed that athletes reported significantly fewer depressive symptoms than non-athletes. The non-athlete sample showed the prevalence rate of 29.4% compared to only 15.6% of the athletes, in this study only males in intercollegiate team sports participated. As noted in the study by Wolanin et al., (2015) unexpected transitions (e.g., due to injury or deselection) may be common factors contributing to the onset of depression or elevated depressive symptoms in athletes. Injuries can cause depressive symptoms in athletes and lead to career termination or time off, fear of failure and not reaching the ultimate goal (Cox, Ross-Stewart and Foltz, 2017; Appaneal et al., 2009; Putukian, 2015; Brewer and Petrie, 1998). Physically injured athletes can

experience a period of emotional distress that in some cases may be severe enough to be identified with clinically depressed symptoms on screening tools like PHQ-9.

According to Wolanin, Gross and Hong, (2015) symptoms that athletes tend to show when experiencing depression are loss of hope, negative feelings about themselves, and lack of reinforcement from the environment. In a study from Tahtinen et al., (2020) athletes with the cut-off score of 10 in PHQ-9 are identified clinically with significant depressive symptoms. Almost 40% of those identified over the threshold did not exhibit depressed mood or lack of interest. In DSM-V (2013) it is a criterion that symptom 1); “Depressed mood most of the day, nearly every day” or 2); “Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day” must be present to be diagnosed as clinically depressed. Suggesting that despite athletes scoring 10 or higher on the PHQ-9 screening tool it does not certainly mean that they would be diagnosed as clinically depressed. Study by Selänne (2016) reports that the first warning signs of overtraining or burnout can appear as signs of depression, fatigue, defensive attitude or as sleeping disorder. Research by Armstrong, Burcin, Bjerke and Early, (2015) shows that symptoms of overtraining syndrome may include exhaustion, low self-esteem, lack of sleep, weight loss and anxiety. Those symptoms might be detected on screening tools as PHQ-9, showing similar appearance as depression.

According to Chang et al. (2019) recognizing depression and providing the proper treatment can improve athletes' mental health and performance outcomes. Athletes can be hesitating when it comes to seeking help for depression as they may be trained to be strong mentally and physically, seeking for help might be considered as a weakness (Wolanin, Gross and Hong, 2015).

1.3 University students and depression

It is reported by Ibrahim, Kelly, Adams, and Glazebrook (2012), where twenty-four articles are identified, that prevalence rates of depression have shown wide variability, range from 10% to 85%, with a weighted mean prevalence of 30.6%. According to Hunt and Eisenberg (2010), depression is a growing concern among university students, the college years represent a developmentally challenging transition to adulthood. Most lifetime mental disorders have the first onset by age of 24 (Hunt and Eisenberg, 2010). In research by Hunt and Eisenberg (2010), it was suggested that low socioeconomic status, poor family support, increased stress, and being a victim of sexual abuse predicted a higher incidence of depression in students (Hunt

and Eisenberg, 2010). However, in a study by Beiter et al. (2015), it is suggested that the foremost cause of depressive symptoms amongst university students is due to academic pressure.

According to Alsulami et al. (2018) the body's response to academic challenges is often stress. Academic challenges that may lead to stress among students can be; academic overload, exams, lack of time to meet commitments, difficult courses, diverse educational systems, and thoughts about the future after graduation (Alsulami et al., 2018; Ramli et al., 2018). It is reported by Alsulami et al., (2018) that 10-30% of students experience some form of stress throughout the academic career, stress can have a negative impact on mental health, which can initiate depressive symptoms (Beiter et al., 2015). According to Beiter et al. (2015) depressive symptoms amongst university students are often; lack of sleep, bad eating habits, and negative body image. Hunt and Eisenberg (2010) noted that it is essential that depressed university students get help, as untreated depression can have severe consequences.

Overall aim of the study was to explore individual athletes and non-athletes when it comes to depressive symptoms. The first aim was to examine if there were gender differences within individual athletes. The second aim was to examine if there was a mean difference in depressive symptoms within athletes and non-athletes. The third aim was to review clinically depressed individuals and investigate specific symptoms to see if the depressive symptoms are different for each group.

2. Methods

2.1 Participants

The participants in the study consisted of individual sport athletes and university students. The athlete sample included males (n = 85) and females (n=97) competing at the national or international level in any of the individual sports that are parts of the National Olympic and Sports Association of Iceland (Íþróttta og Ólympíusamband Íslands, (ISI). Methodology has also been previously presented in research by Taehtinen and Kristjánsdóttir, (2018). The sports that the participants reported practising were; badminton, table tennis, gymnastics, track and field, wrestling, golf, equestrian sports, boxing, judo, karate, bowling, powerlifting, weight-lifting, motorcycle and snow sled sports, ice skating, skiing, shooting sports, swimming, taekwondo, tennis and triathlon. Inclusion requirements for athletes were; Fluent in Icelandic language, being at least 18 years old and competing nationally or internationally in any of the individual sports that are members of the National Olympic and Sports Association of Iceland. The comparison sample consisted of male (n=101) and female (n=270) university students, currently studying in one of the seven Icelandic Universities. Inclusion requirements for the comparison sample were: Fluent in Icelandic language, being 18 years old or older, and not currently competing in sports. Age of the participants ranged from 18 to 36 or older.

2.2 Measures

Background information was gathered by Taehtinen and Kristjánsdóttir (2018), with an online survey. Gender was coded “male” or “female”. Individual athletes reported whether they were currently in the national team or an elite training group.

Patient Health Questionnaire (PHQ-9) is a 9-item measuring scale to screen for depressive symptoms. The nine items are the following: Q1: “Little interest or pleasure in doing things”, Q2: “Feeling down, depressed, or hopeless?”, Q3: “Trouble falling or staying asleep, or sleeping too much“, Q4: “Feeling tired or having little energy”, Q5: “Poor appetite or overeating”, Q6: “Feeling bad about yourself - or that you are a failure or have let yourself or your family down?”, Q7: “Trouble concentrating on things, such as reading the newspaper or watching television?”, Q8: “Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you

have been moving around a lot more than usual?”, Q9: “Thoughts that you would be better off dead, or of hurting yourself in some way?”. There are four answer possibilities, scored from 0 to three, ranging from “not at all” to “nearly every day”. The score range for the total score is from 0-27. PHQ-9 has been found to be a reliable source when screening for depressive symptoms (Kroenke, Spitzer and Williams, 2001) with 10 as the cut-off score. In this sample, reliability was shown to be good ($\alpha = .87$).

2.3 Procedure

The procedures of data in this study was reported earlier by Tahtinen and Kristjánisdóttir (2018). To recruit participants competing in individual sports a non-probability sampling method was used. The study was advertised on Facebook, individual athletes were contacted directly through Facebook or indirectly through their coaches and requested to answer the online questionnaire. Furthermore, The National Olympic and Sports Association helped to contact all individual Sport Federations and requested to forward a link to the online questionnaire to relevant athletes. The link to the questionnaire included a brief description of the purpose, inclusion criteria and then possibility to participate in the online questionnaire. When recruiting university students for the other sample, Tahtinen and Kristjánisdóttir (2018) firstly advertised the study on Facebook with a brief description, inclusion criteria and then possibility to participate by direct link to the online questionnaire. Also, all of the Icelandic Universities were contacted and asked to support by advertising the study on their internal webs or send emails to all students with the relevant information.

2.4 Ethics

According to data collectors, Tahtinen and Kristjánisdóttir (2018), Participants received information about the study purpose and its anonymity in the introduction of the online questionnaire. Participants were informed that participation was voluntary and that participation could be withdrawn at any point during the study. The data for this study was approved by the Icelandic Bioethics Committee (application number 16-148).

2.5 Data analysis

Statistical analysis was made using IBM SPSS Statistics software version 26, figures and tables were outlined in Microsoft Word and Microsoft Excel. To analyse the effect of

gender on depressive symptoms the samples were combined and an independent T-test to compare the means for the genders. The gender differences were also explored separately for athletes and university students. To analyse the effect of participant status (athlete or student) an independent T-test was performed, comparing the total scores for each group. The same analysis was made comparing athlete females and university females and then athlete males and university males. To compare specific symptoms for individual athletes and students with clinically relevant depressive symptoms those scoring 9 or lower were excluded from the data. Then there was performed an independent T-test for each question comparing the mean for the groups to see if there was significant difference. The same test was made for the whole group, with all participants included, and also divided by gender.

3. Results

3.1 Descriptive statistics

Descriptive statistics are shown in table 1. In both samples, more females participated, in the athlete sample (53,3% females, 46,7 % males) but in the university sample (72,8% females, 27,2% males). There was also more data about the university students (N= 371) compared to athletes (N= 182). The age proportions were not the same for the groups; the athlete sample had 30.8% of participants at the age of 18-20 while the student sample had 8.2%.

Table 1

Age and gender distribution within each group

Factor	Athletes		University students	
	N	%	N	%
Gender				
Males	85	46,7%	100	27,2%
Females	97	53,3%	268	72,8%
Age				
18-20	56	31,1%	29	8,0%
21-23	44	24,4%	93	25,6%
24-26	31	17,2%	72	19,8%
27-29	15	8,3%	44	12,1%
30-32	13	7,2%	30	8,3%
33-35	8	4,4%	35	9,6%
36 +	13	7,2%	60	16,5%

3.2 Prevalence

There was a significant difference in prevalence of clinically relevant depression symptoms between athletes and university students. Athletes reported significantly lower prevalence of depression symptoms (20.7%) than students (34.1%)

3.3. The effect of gender on depressive symptoms (Q1)

When gender differences were explored within the total sample, females showed

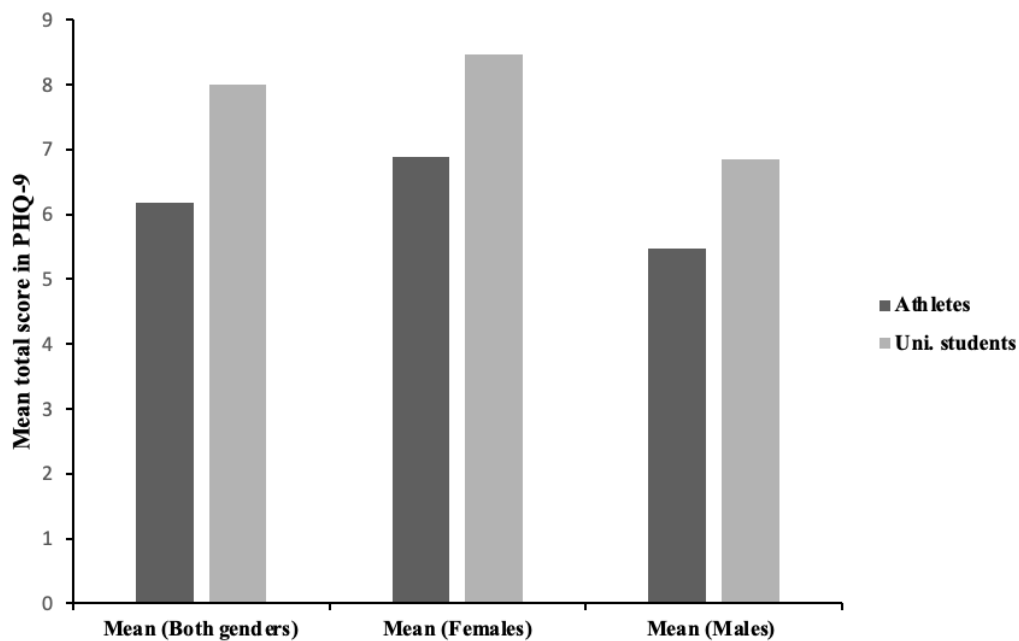
significantly higher mean depressive symptom scores ($M=8.04$, $SD=5.39$) than males ($M=6.21$, $SD=5.01$), $t(548) = 3.85$, $p<.001$

3.4 Mean difference within athletes and students

The second aim was to test if there was a mean difference in depressive symptoms between athletes and students. Results showed that students had a higher total score on average. Athletes scored ($M=6.21$, $SD=5.53$), students ($M=7.96$, $SD=5.5$), the difference was significant $t(547)=3.82$, $p=.001$. When comparing females only, the test showed female athletes had lower total score on average ($M=6.88$, $SD=5.12$) than female students ($M=8.46$, $SD=5.43$), the difference was significant $t(363)=2.50$, $p=.01$ However when comparing males the test did not show significant difference $t(182)=1.86$, $p=.06$, but it showed that male athletes scored lower on average ($M=5.48$, $SD=4.24$) than male students ($M=6.85$, $SD=5.53$). This can be seen visually on Figure 1.

Figure 1

Mean total scores for athletes and university students

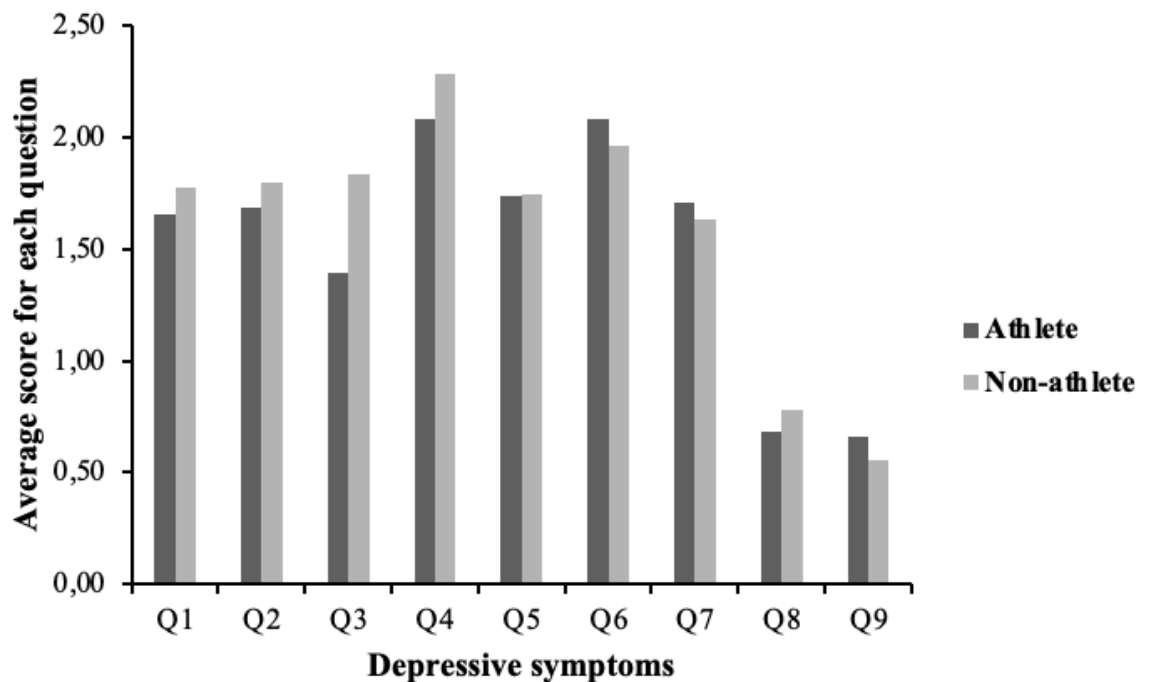


3.5 Specific symptom comparison and analyse for athletes and students

This analysis aimed to assess if there was a difference in how athletes and university students scored among the different depressive symptoms. In the first analysis clinically relevant athletes and students answered questions (total score ≤ 10). The analysis was performed by doing a t-test on each question between the groups. The analyses revealed that there was a statistically significant difference in one of the questions the groups answered. Figure 2 shows the results; it can be observed that there is a difference in more than one question; however, it is not significant. In Question 3: “Trouble falling or staying asleep, or sleeping too much“, the difference was significant $t(126)=2.2, p=.03$ where athletes ($M=1.39, SD=1.03$) scored lower than students ($M=1.83, SD=1.08$).

Figure 2:

Average score on specific symptoms for individuals scoring 10 or higher on PHQ-9



The same analysis was made for athletes and university students, where the whole sample was included. Figure 3 shows the results. In Q1 to Q6 there was significant difference, however on Q7, Q8 and Q9 the difference was not significant. In Q1: “Little interest or pleasure in doing things“, athletes scored ($M=0.81, SD=0.77$), and students ($M=0.97, SD=0.9$) the difference was significant $t(551)=2.1, p=.039$. In Q2: “Feeling down, depressed, or hopeless?“ athletes scored

(M=0.76, SD=0.75), the difference was significant $t(551)=3.6, p=.001$. In Q3: “Trouble falling or staying asleep, or sleeping too much“, athletes scored (M=0.84, SD=0.87), and students (M=1.01, SD=1.02), the difference was significant $t(551)=2.4 p=.016$. In Q4: “Feeling tired or having little energy“ athletes scored (M=1.13, SD=0.84), and students (M=1.4, SD=0.94), the difference was significant $t(551)=3.7 p=.001$. In Q5: “Poor appetite or overeating“ athletes scored (M=0.68, SD=0.86) and students (M=0.90, SD=0.98), the difference was significant $t(551)=2.4 p=.014$. In Q6: “Feeling bad about yourself - or that you are a failure or have let yourself or your family down?“ athletes scored (M=0.84 SD=0.88), and students (M=1.18, SD=0.96), the difference was significant $t(551)=4.0, p<.001$. On figure 4 prevalence for each symptom can be viewed.

Figure 3:

Average score on specific symptoms for athletes and students

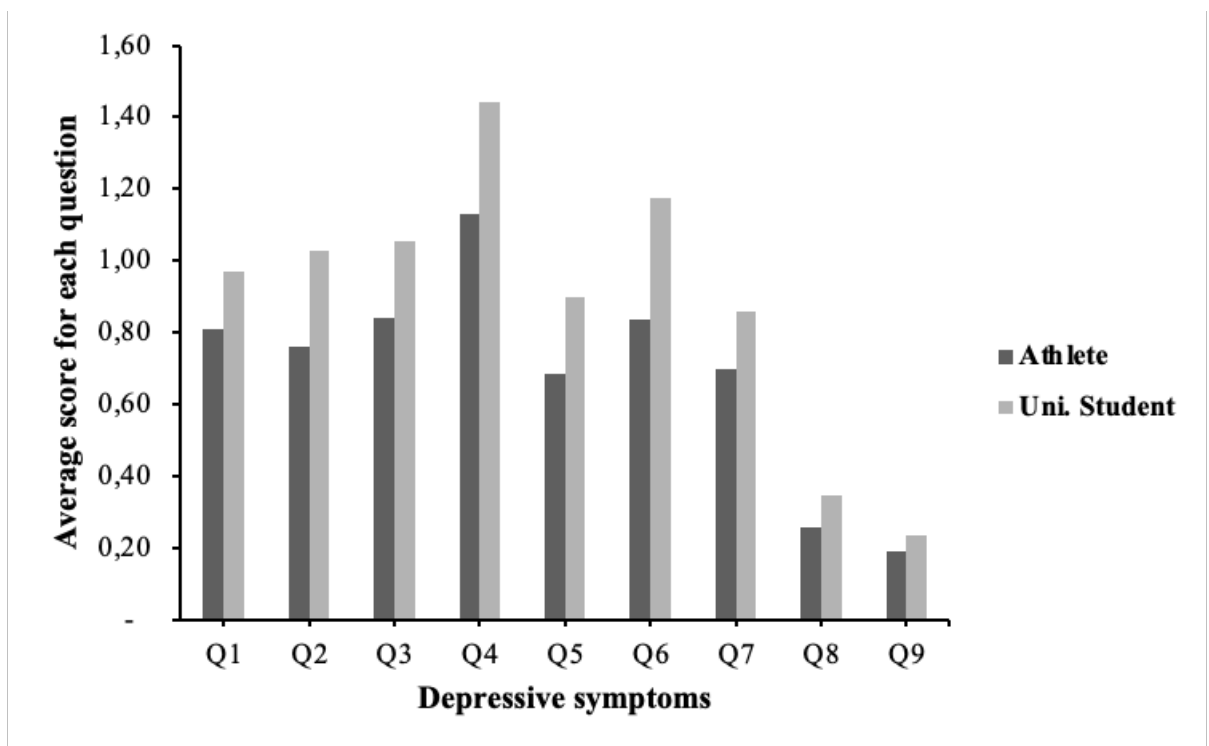
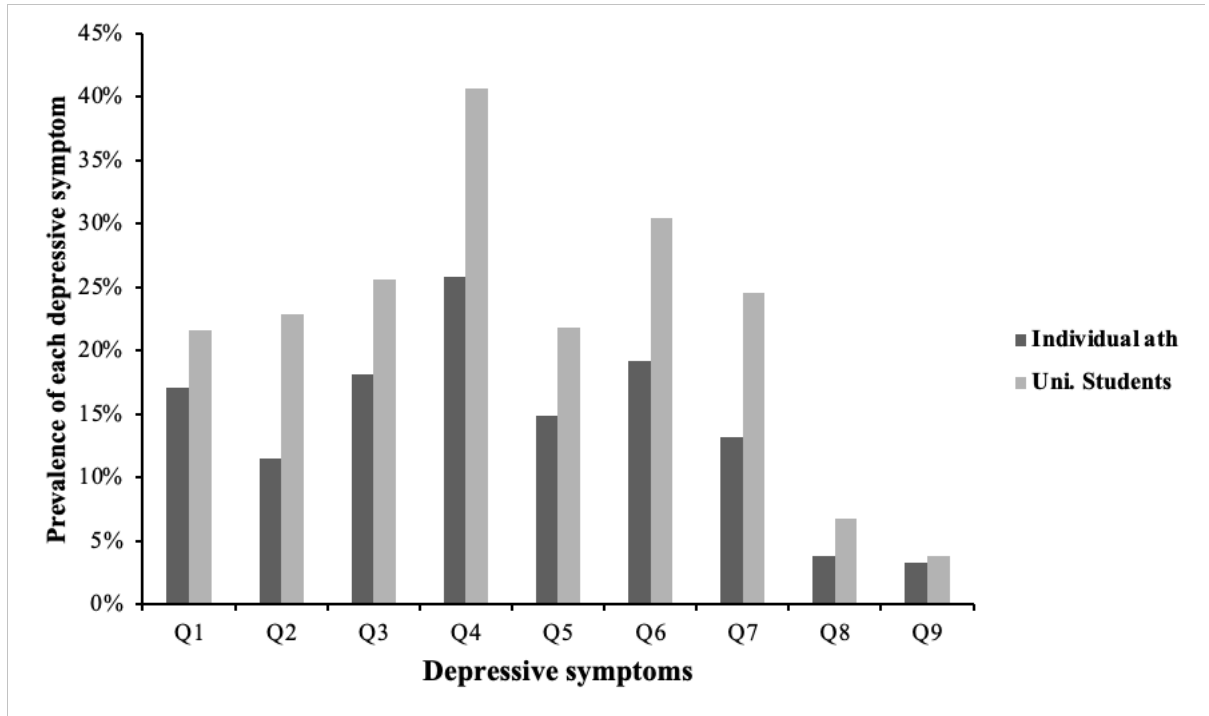


Figure 4

Prevalence in depressive symptoms among athletes and students



4. Discussion

This study aimed to examine depressive symptoms within athletes and university students. The sample of university students was selected as the comparison group, as university students have shown to be an essential population risk group when it comes to the prevalence of depression (Stallman, 2010). The first aim was to see if there was a gender difference in the samples combined and separately. The second aim was to compare the mean of the total score for athletes and students to see if there was a difference between the groups. Then the third aim was to compare specific symptoms from the questionnaire and compare the mean for each answer.

For the first aim, the results showed that females in both samples are more likely to experience depression; this can be substantiated by previous research (Yang et al., 2007). Both in the athlete sample and the university sample, males scored on average lower than females. This was as expected as earlier research has shown that females show a higher prevalence of depression than males (Yang et al., 2007). Possible explanations for these differences between

females and males could be due to hormonal changes in females (Albert, 2015).

For the second aim, the results showed that university students scored significantly higher on the average total score compared to athletes. University students also reported significantly higher prevalence of clinically relevant symptoms (34.1%) than athletes (20.7%). Previous research by Hunt and Eisenberg (2019) reports a prevalence of 30.6% when it comes to depression in university students, suggesting that students are more exposed to depressive periods than the general population. However, the prevalence of clinically relevant symptoms in athletes is higher in this study than some researchers might have suggested (Proctor and Boan-Lenzo (2010). This can possibly be explained by only individual athletes participating as earlier research has showed that they show higher prevalence than team athletes (Nixdorf, Frank, and Beckmann (2016).). The average total score was also compared separately for males and females, between both samples. When comparing females only, female students showed significantly higher scores than female athletes. Male students showed a higher average total score than male athletes, however the difference was not significant.

For the third aim, the mean for each answer was found and compared between the samples. For the first analysis, those scoring nine or below were excluded from the data, as they did not count as clinically relevant (Kroenke, Spitzer, and Williams, 2001); in this analysis, we were interested in the specific symptoms for those scoring ten or higher. Figure 3 shows that university students scored higher on average on most symptoms of the PHQ-9 scale. Studies have shown that physical activity could reduce depressive symptoms and help maintain good mental health (Dehkordi, 2011), university students may lack exercise (Eichorn, Bruner, Short and Abraham, 2018). The most considerable mean difference was in Q3 and Q4. Q3; “Trouble falling or staying a sleep, or sleeping too much” was the only question that showed a significant difference between the groups, suggesting that athletes sleep better than university students. A study by Nutt, Wilson, and Paterson (2008) shows a strong relationship between lack of sleep and depression. Lack of sleep or poor sleep quality can negatively affect everyday life and especially negative impact on people who have depression or those exposed to it. Sleep disturbance can affect various forms; most people who experience sleep disturbance have difficulty concentrating and feel exhausted (Nutt, Wilson and Paterson, 2008). Research shows that lack of sleep can lead to insomnia, and insomnia can lead to depression (Riemann, Berger, and Volderholzer, 2001). Athletes scored higher than university students in Q6, Q7, and Q9, the difference was not significant though. Those questions are Q6: “Feeling bad about yourself - or that you are a failure or have let yourself or your family down?” Q7: “Trouble concentrating

on things, such as reading the newspaper or watching television?”, Q9: “Thoughts that you would be better off dead, or of hurting yourself in some way?”. Studies have suggested that it is common for athletes who experience depression to have bad self-esteem (Wolanin, Gross and Hong, (2015). It could be that question 6 is representing that it should be investigated better. For Q9, it is good to mention that the scores are very low for both samples, the means being 0,66 for athletes and 0,56 for students, and it is one of the most severe symptoms. One of the deficiencies using questionnaires like PHQ-9 is that the total score can be hiding important information about the patient, like more severe symptoms. Therefore it can be crucial to look into the specific symptoms but not the total score alone (Fried and Nesse, 2015).

Another analysis was made for the third aim; specific symptoms were compared within the sample without excluding those scoring 9 or lower. It can be observed in figure 3 that university students scored higher on every question. Although athletes score lower on all symptoms compared to students, athletes do face mental health challenges (Wolanin, Gross, and Hong, 2015). Lastly, in figure 4 the prevalence for each symptom can be viewed. Q4: “Feeling tired or having little energy” was the most reported symptom, both among students and athletes. As concluded earlier, females are more likely to show depressive symptoms; when performing the test for the third aim, where only those with clinically relevant symptoms the gender variables were not included in the test. As shown in Table 1, the university sample had 72,8% females, but the athlete sample had 53,3% females. This higher proportion of females could indicate that the answers from university students show a higher average score than the athlete sample, given that females are more likely to show depressive symptoms. However, when comparing male athletes and male students, the results show a higher mean for university students than athletes; the results were not significant. As mentioned above, when the specific symptoms were compared, all individuals scoring nine or below were excluded from the data, making the samples smaller. The athlete sample consisted of 38 individuals, while the university sample had 128 participants. For future research, it would be interesting to compare the symptoms with more athletes participating to see a more accurate distribution of the nine symptoms. Also, it would open the possibilities of doing the same analysis but with the genders separately. With only 38 individuals with clinically relevant symptoms, it was decided not to make the analysis separated for genders. However, in a larger athlete sample, it would be interesting.

4.2 Limitations

There are some limitations to this study that should be mentioned. A Cross-sectional survey was used to gather data; participants may not provide exact information about themselves. The database could have been more diverse; it contained only 33.3% athletes and 33.6% male participants. In the data collection, there were a total of 187 athletes who answered the questionnaire. In the athlete sample, in total 38 individuals scored 10 or higher on the Patient health questionnaire (PHQ-9) or 20,3% or 12 males and 26 females.

Conclusion

In conclusion, although the results demonstrated that individual athletes show a lower prevalence of depression than university students, they showed a high prevalence (20.7%) compared to the general population. Females in the study showed higher symptoms of depression than males, both among individual athletes and university students. The study showed a different distribution of specific symptoms when explored for those with clinically relevant sum scores compared to the whole sample. The athlete sample showed highest prevalence on the same symptoms as university students “Feeling tired or having little energy”. All in all, university students and athletes showed similar distribution across the specific symptoms, though with higher prevalence amongst students.

References

- Albert P. R. (2015). Why is depression more prevalent in women? *Journal of psychiatry & neuroscience: JPN*, 40(4), 219–221
- Alsulami, S., Al Omar, Z., Binnwejim, M. S., Alhamdan, F., Aldrees, A., Al-Bawardi, A., Alsohim, M., & Alhabeeb, M. (2018). Perception of academic stress among Health Science Preparatory Program students in two Saudi universities. *Advances in medical education and practice*, 9, 159–164. <https://doi.org/10.2147/AMEP.S143151>
- American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA: American Psychiatric Association, 2013.
- American Psychiatric Association. (2013). What Is depression?. Retrieved from <https://www.psychiatry.org/patients-families/depression/what-is-depression>
- Appaneal, R., Levine, B., Perna, F., & Roh, J. (2009). Measuring postinjury depression among male and female competitive athletes. *Journal of Sport & Exercise Psychology*, 31, 60-76. doi:10.1123/jsep.31.1.60
- Armstrong, S., Burcin, M., Bjerke, W., & Early, J. (2015). Depression in student athletes: A particularly at-risk group a systematic review of the literature. *Athletic Insight*, 7803203972, 786-2733. Retrieved from https://www.researchgate.net/publication/290391456_DEPRESSION_IN_STUDE_A_THLETES_A PARTICULARLY_AT_RISK_GROUP_A SYSTEMATIC REVIEW OF THE LITERATURE
- Breslau, J., Gilman, S. E., Stein, B. D., Ruder, T., Gmelin, T., & Miller, E. (2017). Sex differences in recent first-onset depression in an epidemiological sample of adolescents. *Translational Psychiatry*, 7(5), e1139–e1139. <https://doi.org/10.1038/tp.2017.105>

- Cox, C., Ross-Stewart, L., & Foltz, B. (2017). Investigating the prevalence and risk factors of depression symptoms among NCAA division I collegiate athletes <http://Www.davidpublisher.org/index.php/home/journal/detail?journalid=1&jx=JSS> cont=allissues. *Journal of Sports Science*, 5 doi:10.17265/2332-7839/2017.01.002
- Craft, L. L., & Perna, F. M. (2004). The benefits of exercise for the clinically depressed. *Primary Care Companion to the Journal of Clinical Psychiatry*, 6(3), 104-111. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC474733/>
- Cuijpers, P., Koole, S. L., van Dijke, A., Roca, M., Li, J., & Reynolds, C. F. (2014). Psychotherapy for subclinical depression: Meta-analysis. *The British Journal of Psychiatry*, 205(4), 268-274. doi:10.1192/bjp.bp.113.138784
- Dehkordi, A. G. (2011). The comparison between athlete females and non-athlete females regarding to general health, mental health, and quality of life. *Procedia, Social and Behavioral Sciences*, 15, 1737-1741. doi:10.1016/j.sbspro.2011.03.361
- Fried, E. I., & Nesse, R. M. (2015b). Depression sum-scores don't add up: Why analyzing specific depression symptoms is essential. *BMC Medicine*, 13(1), 72. <https://doi.org/10.1186/s12916-015-0325-4>
- Golding, L., Gillingham, R. G., & Perera, N. K. P. (2020). The prevalence of depressive symptoms in high-performance athletes: A systematic review. *The Physician and Sportsmedicine*, 48(3), 247-258. doi:10.1080/00913847.2020.1713708
- Gouttebauge, V., Backx, F., Aoki, H., & Kerkhoffs, G. (2015). Symptoms of common mental disorders in professional football (soccer) across five european countries. *Journal of Sports Science & Medicine*, 14, 811-818. Retrieved from https://www.researchgate.net/publication/283079887_Symptoms_of_Common_Mental_Disorders_in_Professional_Football_Soccer_Across_Five_European_Countries

[es](#)

- Gouttebarga, V., Castaldelli-Maia, J. M., Gorczynski, P., Hainline, B., Hitchcock, M. E., Kerkhoffs, G. M., . . . Reardon, C. L. (2019a). Occurrence of mental health symptoms and disorders in current and former elite athletes: A systematic review and meta-analysis. *British Journal of Sports Medicine*, 53(11), 700-706. doi:10.1136/bjsports-2019-100671
- Hankin, B. L., Abramson, L. Y., Moffitt, T. E., Silva, P. A., McGee, R., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10- year longitudinal study. *Journal of Abnormal Psychology*, 107(1), 128. <https://doi.org/10.1037/0021-843X.107.1.128>
- Hj Ramli, N. H., Alavi, M., Mehrinezhad, S. A., & Ahmadi, A. (2018). Academic Stress and Self-Regulation among University Students in Malaysia: Mediator Role of Mindfulness. *Behavioral sciences (Basel, Switzerland)*, 8(1), 12. <https://doi.org/10.3390/bs8010012>
- Hunt, Justin, M.D., M.S., & Eisenberg, D., Ph.D. (2010). Mental health problems and help-seeking behavior among college students. *Journal of Adolescent Health*, 46(1), 3-10. doi:10.1016/j.jadohealth.2009.08.008
- Ibrahim, A. K., Kelly, S. J., Adams, C. E., & Glazebrook, C. (2012). Journal of psychiatric research. *Journal of Psychology and Theology*, 40(2), 64. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0022395612003573>
- Inoue, T., Tanaka, T., Nakagawa, S., Nakato, Y., Kameyama, R., Boku, S., . . . Koyama, T. (2012). Utility and limitations of PHQ-9 in a clinic specializing in psychiatric care. *BMC Psychiatry*, 12(1), 73. doi:10.1186/1471-244X-12-73

- Ji, J. (2012). Distinguishing subclinical (subthreshold) depression from the residual symptoms of major depression. *Shanghai Jingshen Yixue*, 24(5), 288-289. doi:10.3969/j.issn.1002-0829.2012.05.007
- Jones, S. R., Carley, S., & Harrison, M. (2003). An introduction to power and sample size estimation. *Emergency Medicine Journal*, 20(5), 453-458. doi:10.1136/emj.20.5.453
- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9. *Journal of General Internal Medicine*, 16(9), 606-613. doi:10.1046/j.1525-1497.2001.016009606.x
- Lebrun, F., MacNamara, A., Rodgers, S., & Collins, D. (2018). Learning from elite athletes' experience of depression. *Frontiers in Psychology*, 9 doi:10.3389/fpsyg.2018.02062
- Lefever, S., Dal, M., & Matthíasdóttir, Á. (2007). Online data collection in academic research: Advantages and limitations. *British Journal of Educational Technology*, 38(4), 574-582. doi:<https://doi.org/10.1111/j.1467-8535.2006.00638.x>
- Nixdorf, I., Frank, R., & Beckmann, J. (2016). Comparison of athletes' proneness to depressive symptoms in individual and team sports: Research on psychological mediators in junior elite athletes. *Frontiers in Psychology*, 7, 893. doi:10.3389/fpsyg.2016.00893
- NUTT, D., WILSON, S., & PATERSON, L. (2008). Sleep disorders as core symptoms of depression. *Dialogues in Clinical Neuroscience*, 10(3), 329-336. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/18979946>
- Proctor SL, Boan-Lenzo C. Prevalence of depressive symptoms in male intercollegiate student-athletes and nonathletes. *J. Clin. Sport Psychol.* 2010; 4: 204–20.

Putukian M. (2015). The psychological response to injury in student athletes: a narrative review with a focus on mental health. *Br J Sports Med*, 50, 145-148. doi:10.1136/bjsports-2015-095586

Razzak, H. A., Harbi, A., & Ahli, S. (2019). Depression: Prevalence and associated risk factors in the united arab emirates. *Oman Medical Journal*, 34(4), 274-282. doi:10.5001/omj.2019.56

Rice, S., Purcell, R., De Silva, S., Mawren, D., McGorry, P., & Parker, A. (2016). The mental health of elite athletes: A narrative systematic review. *Sports Medicine (Auckland)*, 46(9), 1333-1353. doi:10.1007/s40279-016-0492-2

Riemann, D., Berger, M., & Voderholzer, U. (2001). Sleep and depression — results from psychobiological studies: An overview. *Biological Psychology*, 57(1), 67-103. doi:10.1016/S0301-0511(01)00090-4

Schaal, K., Tafflet, M., Nassif, H., Thibault, V., Pichard, C., Alcotte, M., Guillet, T., El Helou, N., Berthelot, G., Simon, S., & Toussaint, J.-F. (2011). Psychological balance in high level athletes: Gender-based differences and sport-specific patterns. *Plos One*, 6(5), e19007–e19007. <https://doi.org/10.1371/journal.pone.0019007>

Selänne, H. (November 18, 2016). Overtraining and burnout in sport

Salehian, M.H., Gursoy, R., Aftabi, G.R., Sardarudi, M.T. and Anvari, Z.D. (2012) Comparison of depression between university athletes and non-athletes. *European Journal of Experimental Biology*, 2 (4):1008-1011

Tahtinen, R., Kristjánisdóttir, H., Olason, D., & Morris, R. (2021). What lies beneath: Exploring specific depressive symptoms across selected risk factors in icelandic team sport athletes. *Journal of Clinical Sport Psychology*,

Wolanin, A., Gross, M., & Hong, E. (2015). Depression in athletes: Prevalence and risk factors. *Current Sports Medicine Reports*, 14(1), 56–60. doi:10.1249/JSR.0000000000000123

World Health Organization. (2020, January 30). “*Depression.*” Retrieved from https://www.who.int/news-room/fact-sheets/detail/depression?fbclid=IwAR3r9ETmVX54iBcSB0lYm7y7jwbzM3KKBy8Y57IHOP_RMNgmIU2k0TdMqDw

World Health Organization. (n.d.) “*Depression.*” Retrieved from https://www.who.int/health-topics/depression?fbclid=IwAR0lSrdGIg-3dkkIFUab-EuNL9lx-dIjhc2jAoL8SGU753hJ9wPbDI0FL-g#tab=tab_1

World Health Organization. (2018, March 30). “*Mental health: strengthening our response.*” Retrieved from <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response?fbclid=IwAR398rSUDDd9kD2IYWWAk9HREUWgMteEerjxeMoSTm8F0qIxUgLsf0GkIKk>

Yang J, Peek-Asa C, Corlette JD, et al. Prevalence of and risk factors associated with symptoms of depression in competitive collegiate student athletes. *Clin. J. Sports Med.* 2007; 17: 481–7.