Mental health among Swedish elite athletes: Depression, overtraining, help seeking, and stigma

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There is a general perception in the public that mental health problems scarcely exist among elite athletes. The aim of this thesis was to investigate mental health among Swedish elite athletes with a particular focus on depression, overtraining, help seeking and stigma. The sample consisted of 100 athletes; of these 32 % were male and 68 % female, 53 % team athletes and 47 % individual athletes representing 15 different sports. A cross-sectional research design using self-report measures examined variables associated with the mental health of athletes. Results showed the prevalence of depression in the sample was similar to that of the general population. Athletes who reported symptoms of overtraining also reported symptoms of depression. Depressed athletes showed significantly more symptoms of overtraining than non-depressed athletes. Athletes who reported greater symptoms of depression or overtraining also reported higher levels of stigma associated with the condition. In the sample 45 % of participants reported that it was unlikely or extremely unlikely that they would seek help for mental health problems. The results indicate that mental health problems among elite athletes do exist. Athletes that experience problems with their mental health also do not want to disclose these problems. The established relationship between depression and overtraining highlights the difficult in distinguishing between the concepts that may ultimately lead to misdiagnose and ineffective treatment of the symptoms. Sport specialization in health care is required in order to meet the needs of elite athletes.

Det finns en allmän syn i samhället att psykisk ohälsa bland elitidrottare är väldigt ovanligt. Syftet med denna studie var att undersöka psykisk ohälsa bland svenska elitidrottare med fokus på depression, överträning, hjälpsökande och stigma. Urvalet bestod av 100 elitidrottare; av dessa var 32 % män och 68 % kvinnor, 53 % lagidrottare och 47 % individuella idrottare vilka representerade 15 olika idrotter. En tvärsnittsstudie genomfördes med hjälp av självskattningsformulär vilka undersökte variabler förknippade med elitidrottare psykiska hälsa. Resultaten visade en prevalens av depression bland elitidrottarna motsvarande den allmänna populationen. Elitidrottare som rapporterade symptom på överträning rapporterade även symptom på depression. Deprimerade elitidrottare hade signifikant fler symptom på överträning än icke-deprimerade elitidrottare. Elitidrottare som rapporterade fler symptom på depression eller överträning rapporterade även högre nivåer av stigma. I urvalet rapporterade 45 % av deltagarna att det var osannolikt eller extremt osannolikt att de skulle söka hjälp vid problem med psykisk ohälsa. Resultaten visar på att psykisk ohälsa bland elitidrottare existerar. Elitidrottare med psykisk ohälsa är obenägna att avslöja dessa problem för andra. Den påvisade relationen mellan depression och överträning visar på att det är svårt att skilja mellan dessa koncept vilket i förlängningen kan leda till feldiagnostisering av symptomen samt att fel behandlingsinsatser sätts in. För att möta behoven från elitidrottare bör hälso- och sjukvården erbjuda idrottsspecifik behandling.
The elite athlete is often portrayed as a superhero. An idealized person that can go above and beyond the everyday challenges. To succeed as an elite athlete a high level of mental toughness is required (Bauman, 2016). This mental toughness makes it easy to assume that mental health problems rarely exist in this population. Suffering with mental health problems does not fit into this idealized image; in the media there are infrequent reports of athletes that struggle with mental health issues. Limited discussion of mental health in sport promotes the assumption that the prevalence of mental illness in athletes is low. However, elite athletes are also human; the argument can be put forward that the prevalence of mental health issues in athletes is similar to that identified in the general population. The lack of acknowledgement of mental health issues among elite athletes can also render negative feelings towards seeking appropriate help. In particular, Gulliver, Griffiths, and Christensen (2012) highlight that the stigma surrounding mental health was reported to be the most impactful barrier on young elite athletes seeking help.

**Elite athletes and mental health**

There have been several studies on mental health among athletes. It can be argued that the focus primarily have been on “typical” athlete disorders such as eating disorders and substance abuse since these are some of the most studied disorders (Reardon & Factor, 2010). However, it is suggested that mental health problems are as common in professional sports as within the general population (Markser, 2011). Recent studies from Australia and the Netherlands have examined prevalence of mental health problems in elite athletes (Gouttebarge, Jonkers, Moene, Verhagen, Wyllemane & Kerkhoffs, 2016; Gulliver, Griffiths, Mackinnon, Batterham & Stanimirovic, 2014). In Australia mental health problems in the general population were most prevalent among people aged 16-34 years old, the clinical criteria for at least one disorder was met by 25%. Elite athletes were no exception, 46% of the athletes showed symptoms of at least one mental disorder. The mental health problems assessed were panic disorder (5%), generalised anxiety disorder (7%), social anxiety (15%), general psychological distress (17%), eating disorder (23%) and depression (27%). Specific stressors for the elite athletes were relocating for sport, exposure to athlete specific stress and injury. Especially injury was found to be linked with depression in athletes. (Gulliver et al., 2014). The study in the Netherlands found prevalences in the elite athletes of adverse alcohol use (6%), distress (27%), anxiety/depression (45%), sleep disturbance (22%), eating disorder (32%). These results reflected the prevalence of the general population in the Netherlands. Lower level of social support and higher number of past severe injuries were linked to symptoms of mental health problems among the athletes (Gouttebarge et al., 2016).

In contrast to the general population, the elite athlete endure mental and physical strains which might influence the start and the intensity of their mental health problems. Understanding elite athletes, their specific context and providing sport specific treatment is important (Bär & Markser, 2013). The two newly opened facilities for elite athletes in Stockholm and Malmö are examples of this need being recognized; the facilities are a collaboration between the Swedish Sports Confederation and the county council with the aim to prevent mental health problems among elite athletes (Riksidrottsförbundet, 2016).

According to the Swedish National Board of Health and Welfare, 25% of all women and 15% of all men experience depression during their lifetime. For anxiety, approximately the same numbers apply (Socialstyrelsen, 2016). Depression and anxiety are closely related disorders and have a high rate of comorbidity (Lamers et al., 2011). A recent meta-analysis conducted on five studies from USA, Iran, Germany and Switzerland reported rates of depressive symptoms in the general population ranging from 6% to 43% (Gorczynski, Coyle & Gibson, 2017). Empirical research has outlined that depression is equally common in athletes as in the general population (Reardon & Factor, 2010). However, there is currently little study of elite athlete’s depressive symptoms (Nixdorf, Frank, & Beckmann, 2016). Conversely, studies concerning depression in
the general public are numerous (Richards, 2011). Depression is established as a clinical diagnosis that identifies a period of at least 2 weeks during which there is either low mood, loss of interest or pleasure in nearly all activities, accompanied by other symptoms such as insomnia and changes in appetite, energy, and concentration (American Psychiatric Association, 2013).

In the same meta-analysis as mentioned above elite athletes was compared with non-athletes regarding depression and it was found that athletes were just as likely as non-athletes to report depressive symptoms. The rates of depressive symptoms in male athletes ranged between 4 % and 27 % and for female athletes between 10 % and 37 %. The rates for male non-athletes ranged from 8 % to 34 % and for female non-athletes from 6 % to 43 %. Male athletes were 52 % less likely to report depressive symptoms than their female counterparts. (Gorczynski et al., 2017). Nixdorf et al. (2016) found that athletes in individual sports reported higher scores of depressive symptoms than athletes in team sports when replicating an earlier study. The authors concluded that negative attribution after failure were one important factor for explaining the different vulnerabilities to depression in team and individual sports.

Basic training principles

Elite athletes put themselves through rigorous and painful training regimens to increase performance. This type of training can not be compared to recreational training for non-elite athletes. Training periodization is the key to how elite athletes tolerate increased loads of training - meaning interspersed periods of rest and recovery. Overreaching is considered an accumulation of training load that leads to performance decrements requiring days to weeks for recovery. When overreaching is followed by appropriate rest it could lead to performance increase which is called supercompensation. (Kreider, Fry, and O'Toole, 1998).

Basic principles of training (Meeusen et al., 2013):

• Acute overload (tiredness, performance reduction for a few hours)
• Overreaching = temporary (a few days up to two weeks performance reduction, tiredness)
• Recovery = back to base level
• Supercompensation = recovery to a higher level

Overtraining

The reviewed literature on overtraining syndrome reveals that there is no simple explanation for, or definition of the syndrome. The joint consensus statement made by the European College of Sport Science and the American College of Sports Medicine from 2013 was an attempt to present the current state of knowledge on the overtraining syndrome (Meeusen et al., 2013).

It has not been shown what is the direct cause and effect of overtraining. Research has however shown that an onset of overtraining is a training error resulting in an imbalance between training load and recovery (Meeusen et al., 2013).

In this thesis, we will not discriminate between overtraining and non-functional overreaching because the differentiation between the two is very difficult, only a clinical diagnosis made in retrospect could separate the two (Main & Landers, 2012). We will hereafter only use the term overtraining when describing both overtraining and nonfunctional overreaching.

Studies have indicated the existence of a relationship between training load and mood (Morgan, Brown, Raglin, O’Connor & Ellickson, 1987; Raglin & Wilson, 2000). When training loads rise in volume or intensity so does mood disturbances. Depression, vigour and fatigue appear to be three of the more responsive measures (Raglin, Morgan & O’Connor, 1991). After an an intense training period the mood scores return to the baseline levels which are typically seen in the beginning of a season (Morgan et al., 1987). Physical soreness/stiffness/heaviness and sleep disturbance have also been shown to be responsive to changes in training load.
Also relevant to measure is signs of stress in athletes (Halson, Bridge, Meeusen, Busschaert, Gleeson, Jones & Jeukendrup, 2002; Hynynen, Uusitalo, Konttinen & Rusko, 2006). Studies have also indicated a relationship between well-being (subjectively measured) and training imposed stress with well-being deteriorating with increased training load and improving with reduced loads (Saw, Main & Gastin, 2015).

The sole causative factor of overtraining is not necessarily training. Athletes who undergo the same amount and type of overload training are not at the same risk for overtraining, an interindividual variation exists (Meeusen et al., 2013). Also worth noting is that a distinction has to be made between training loads and training hours. For instance, Gould, Tuffey, Udry and Loehr (1996) found that other variables than training hours were responsible for a decrease in well-being, e.g. the continuous physical and mental workload.

A diagnosis of overtraining is proposed by excluding all other possible explanations for a drop in performance and negative changes in mood state. Therefore, overtraining is diagnosed only if no other physical explanation can be found (e.g., organic disease, infection or insufficient caloric intake; Meeusen et al., 2013). It is also problematic for both research and practice, that no single test for diagnosing overtraining has been established. Furthermore, overtraining is only diagnosed in retrospect after observing the duration of the drop in performance (Meeusen et al., 2013). Finding appropriate measures for identifying symptoms of overtraining is very much sought after at the moment. Subjective self-reported measures have been found useful for athlete monitoring. Self-report measures were also shown to respond to changes in well-being due to changes in training load (Saw, Main & Gastin, 2015).

The fact that overtraining is difficult to diagnose and only diagnosed in retrospect makes prevalence percentages uncertain at best. In a large study on British athletes it was found that 29 % had experienced overtraining at least once (Matos, Winsley & Williams, 2011). These prevalence percentages coincides with similar studies on Swedish age-group athletes where a prevalence of 37 % of symptoms of overtraining was found (Kenttä et al., 2001). In adolescent elite swimmers, a prevalence of 35 % of symptoms of overtraining was found (Raglin, Sawamura, Alexiou, Hassmén & Kenttä, 2000).

Rest and very light training appears to be the only treatment which has an effect on recovery from overtraining (Meeusen et al., 2013). Any mention of treatment for the psychological symptoms of overtraining is lacking in the joint consensus statement. Other authors on the subject discuss and suggest the need for psychological treatment for athletes with overtraining (e.g. Bär & Markser, 2013; Kreher & Schwartz, 2012). The contemporary research on overtraining often takes a physiological point of view (Jones & Tenenbaum, 2009) and is mainly focused on finding biological markers (Kreher, 2016). This is perhaps not strange since it would be very helpful if there existed a test which could help prevent overtraining. The authors of this thesis make the argument that overtraining is perhaps best explained as a multicomponent concept meaning that it is not possible to distinguish the concept as entirely physiological or psychological. In the thesis the authors have made an attempt to apprehend the symptoms of overtraining from a psychological standpoint. In this thesis symptoms of overtraining is measured by the Multi-component Training Distress Scale (MTDS), with high scores indicating more symptoms of overtraining.

Distinguishing between the concepts of depression and overtraining

It is difficult to distinguish between depression and overtraining as they present many common symptoms. The symptoms of depression and overtraining is presented in Table 1.
### Table 1

**Symptoms of depression and overtraining**

<table>
<thead>
<tr>
<th>Depression</th>
<th>Overtraining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressed mood</td>
<td>Decreased physical performance</td>
</tr>
<tr>
<td>Diminished interest/pleasure in activities</td>
<td>Feelings of depression</td>
</tr>
<tr>
<td>Significant weight loss/ weight gain</td>
<td>Loss of bodyweight</td>
</tr>
<tr>
<td>Change in appetite</td>
<td>Change in appetite</td>
</tr>
<tr>
<td>Insomnia/hypersomnia</td>
<td>Insomnia</td>
</tr>
<tr>
<td>Psychomotor agitation/retardation</td>
<td>Loss of vigour</td>
</tr>
<tr>
<td>Fatigue or loss of energy</td>
<td>Fatigue</td>
</tr>
<tr>
<td>Feelings of worthlessness</td>
<td>Loss of motivation</td>
</tr>
<tr>
<td>Recurrent thoughts of death</td>
<td>Malaise</td>
</tr>
<tr>
<td>Irritability</td>
<td>Irritability</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Loss of motivation</td>
<td>Loss of motivation</td>
</tr>
<tr>
<td>Diminished ability to think or concentrate</td>
<td>Lack of mental concentration</td>
</tr>
</tbody>
</table>

Note: Table created by the authors using the following references: American Psychiatric Association, 2013; Herlofson, 2014 and Meeusen, 2013.

Moreover, there appears to be shared physiological and neural symptoms (i.e. it is affecting the same neurotransmitters and hormones) of overtraining and depression (Armstrong & VanHeest, 2002; Meeusen, Watson, Hasegawa, Roelands & Piacentini, 2007). Schwenk (2000) argues that as a result of overtraining and depression sharing numerous physiological similarities there is a case to be made that a distinction between the two cannot be established. In a study of swimmers over a ten year period Morgan et al. (1987) found that as many as 80% of the athletes they identified as being overtrained also exhibited clinically significant depression. Arguments for the two conditions being separate can also be made. Some symptoms of overtraining are not present in depression such as the common symptoms of muscle soreness, elevated heart rate and blood pressure and changes in certain hormone levels (Meeusen et al., 2013; Reardon & Factor, 2010).

Studies undertaken with the general public have highlighted that physical activity can have a preventive effect on depression and is recommended for treatment of depression (Socialstyrelsen, 2016). However, alternative studies have emphasised that intense physical activity can lead to symptoms of depression (Nixdorf & Beckmann, 2016). These contrary positions on the relationship between physical activity, well-being and depressive symptoms suggest the relationship may be nonlinear and complex.

### Help seeking and stigma

Seeking professional help when experiencing problems with mental health does not have to be controversial. Young people, however, tend to have a reluctance towards seeking professional help (Rickwood, Deane & Wilson, 2007). Being an elite athlete could further complicate matters since the conditions are so special regarding these athletes and also the context in which they perform.

So why do not athletes seek help for their mental health problems? Some studies have examined this further. Perceived stigma has been reported as one of the dominant barriers to athletes seeking help for mental health problems (Gulliver et al., 2012). Stigma has been described as “[…] the subjective perception of being devalued and marginalized that directly affects a person’s sense of self-esteem and level of distress.” (Boyd Ritsher, Otilingam & Grajales, 2003 p. 32). The athletes in Gulliver et al.’s study (2012) cited their coaches and
teammates as people they would not want to disclose their possible mental health problems to, this because of fear to be perceived as weak or unable to cope.

Negative attitudes towards help seeking was found in the above mentioned study which used focus group discussions. One of the groups expressed that “it would be much more embarrassing for the athlete if they were to seek help for depression, or any other “major” [...] concern not related to sport” (Gulliver et al., 2012 p. 10). Other factors such as being afraid of losing their position on the team and even their contract may inhibit the athletes to seek help (Bauman, 2016). Another factor could be that athletes do not wish to interrupt their athletic careers.

Not being able to distinguish symptoms of mental health problems from those of “normal” elite athlete behaviours could also hinder the findings of mental health problems (Reardon & Factor, 2010). There is a risk of health care personnel minimizing the existence of mental health symptoms in elite athletes because of the notion of being an athlete means also being a “healthy” person. The stigma could also come from the athlete themselves. Reardon and Factor contend that athletes themselves have a tendency to minimize signs of weakness (Reardon & Factor, 2010).

Factors that have been seen to increase help seeking were having an established relationship with a caregiver, previous pleasant experience with a caregiver, positive attitudes of others (specifically the coach), access to the internet and encouragement from others (Gulliver et al., 2012).

Aim of the thesis

The aim of the thesis is to investigate the prevalence of depression within the elite athlete population, and examine the potential relationship between depression and overtraining. Further, athletes’ perspectives of mental health, and potential stigmas, will be explored with a particular focus on their views of help seeking.

In review of previous research, we hypothesize that the prevalence of depression in elite athletes will reflect similar levels observed in the general public. Moreover, we expect that athletes who report symptoms of overtraining will also report symptoms of depression. Additionally, we anticipate that athletes reporting greater symptoms of depression or overtraining will also report higher levels of stigma.

Method

Design

In consideration of the aims of the present study and in review of previous research, a cross-sectional questionnaire based study was undertaken in order to assess the incidence and associations of the concepts under examination.

Participants

The participants comprising the present study consisted of 103 Swedish elite athletes located nationwide. Three participants were excluded due to too many missing responses therefore making the sample comprising 100 elite athletes. The inclusion criteria for participants to be considered ‘elite’ and appropriate for the study aligned with the Umeå School of Sport Sciences (www.ih.umu.se/elitidrott-och-studier/):

- Individual elite athletes competing at a national championship level and/or representing the national team.
- Elite athletes competing in team sports active in one of the two highest national divisions provided there is at least four divisions, if not then only the highest division.

Recruitment emails were first sent to a number of national teams, training groups at the Umeå Centre for Sports Sciences, elite level sport clubs, and individual athletes that fulfilled the inclusion criteria. Those athletes and clubs that replied, indicating their interest in participating were forwarded a link to a websurvey provided via Textalk. In total, the websurvey was completed by 61 athletes. The authors did not receive information regarding the number of athletes presented with the link to the websurvey making a response rate impracticable. Additionally, local elite athletes were provided the opportunity to complete the questionnaires using paper and pencil. A number of 43 elite athletes were presented with this opportunity, one athlete did not submit the questionnaire. A total of 42 questionnaires were completed using paper and pencil making the response rate for this modality 97.67%.

Sports included in the sample were:

- badminton
- bandy
- basketball
- cross-country skiing
- floorball
- gymnastics
- handball
- hockey
- long distance running
- orienteering
- ski-orienteeing
- swimming
- track and field
- ultra distance running
- wrestling

The sample analysed consisted of 68 female (68%) and 32 male (32%) elite athletes (n = 100). Ages ranged between 16 and 45 years with an average age of 24.67 years (SD = 5.59; athletes under the age of 18 n=2 fulfilled the inclusion criteria). Almost half of the sample (47%) were athletes competing in an individual sport and the other half (53%) were team sport athletes. The mean age for individual athletes was 26.02 years (SD = 6.93) and for athletes in team sports the mean age was 23.47 (SD = 3.74). Athletes also reported their years in the sport (M = 14.22, SD = 5.30) and hours training per week (M = 12.12, SD = 4.30).

Measures

Demographic information was collected from the participants concerning their gender, age, hours training per week, years in the sport and sport.

Hospital Anxiety and Depression scale (HADS; Zigmond & Snaith, 1983). The HADS contains 14 items in total; 7 items measuring anxiety and 7 measuring depression. One aim of the thesis is to investigate the prevalence of depression within the elite athlete population. Using the HADS scale provided additional measurements of anxiety, a concept which is not part of the aim of this thesis. The authors have made the choice to include these results as well, since they are worth noting. The HADS presents answers on a four point likert scale; the maximum score is 21 for each subscale (i.e., anxiety and depression). The higher the score, the greater the symptoms of depression or anxiety. In the present study, the HADS standardized cut-off scores for depression were used: 7 points or below = no depression/anxiety of clinical meaning; 8-10 points = borderline depression/anxiety and could indicate a condition of depression or anxiety; 11 points of more = depression/anxiety of clinical meaning; 15-21 points indicates severe depression/anxiety. The Swedish version of the HADS was used (Lisspers, Nygren & Söderman, 1997). The HADS has been previously observed to demonstrate acceptable reliability in non-clinical samples; anxiety (Cronbach’s α = 0.82), depression (Cronbach’s α = 0.77) and total score (Cronbach’s α = 0.86) with the correlation between the anxiety and depression scales being
moderate ($r = 0.53, p < 0.01$; Crawford, Henry, Crombie & Taylor, 2001). Further, the validity of the HADS for non-clinical samples concurrent validity has been observed to be good to very good (Bjelland, Dahl, Tangen Haug & Neckelmann, 2002). Use of the HADS in the present study demonstrated good internal consistency (Cronbach’s $\alpha = 0.75$).

Multi-component training distress scale (MTDS; Main & Grove, 2009). The MTDS contains 22 items regarding symptoms of overtraining with six subscales: “depressed mood”, “perceived vigour”, “physical symptoms”, “sleep disturbance”, “perceived stress” and “general fatigue”. MTDS presents answers on a five point likert scale ranging from zero (never/not at all) to four (very often/extreme amount), the maximum score is 88 points. The MTDS has acceptable reliability regarding the six subscales (Cronbach’s $\alpha$ ranging between 0.72 and 0.86), evidence of construct validity and has been used with similar populations previously (Main & Grove, 2009). The authors translated the self-report measure into a Swedish version. One of the authors translated the report into Swedish and the other author translated it back to English for verification. The authors then discussed and adjusted the self-report into its final Swedish version. This instrument was chosen because it has the advantage of having a multidimensional take on the concept of overtraining by measuring it over six subscales and is a comprehensive measure. The MTDS in our sample showed good internal consistency (Cronbach’s $\alpha = 0.90$).

Help seeking behaviour. Athletes were provided with two items to measure their intention to seek help regarding mental health issues. Specifically, athletes were asked, “Have you previously sought help for mental health problems?” using forced-choice (i.e., yes-no) options. The other item, “How likely is it that you would seek help for mental health problems if you were to experience them?” was presented with a five-point range likert scale anchored with one (extremely unlikely) and five (extremely likely). The second item is a measure of behavioural intention in accordance with the theory of planned behaviour which has support in predicting intentions and behaviours (Ajzen, 1991).

The Revised Stigma Scale (R-STIGMA). Athletes were provided with 9 items regarding stigma surrounding mental health and disclosure. These items were based on the Stigma Scale (King, Dinos, Shaw, Watson, Stevens, Passetti & Serfaty, 2007), subcategory Disclosure. The original Stigma Scale consists of three subcategories; the subcategory Disclosure was chosen due to relevance for the study, the other two categories Discrimination and Potential positive aspects of mental illness did not apply in a hypothetical situation. The Stigma Scale (Disclosure) has acceptable reliability (Cronbach’s $\alpha = 0.85$). The Stigma Scale presents answers on a five point likert scale with the anchors of zero (strongly agree) and four (strongly disagree), the maximum score on the Revised Stigma Scale is 36 points. The Stigma Scale was originally constructed for patients with clinical psychological diagnoses. The items were therefore edited to be more applicable to the present study and hypothetical items were used. For example, in the original version an item states “I do worry....”, the authors changed it to “I would worry...”. The authors translated the self-report measure into a Swedish version. One of the authors translated the report into Swedish and the other author translated it back to English for verification, the authors then discussed and adjusted the self-report into its final Swedish version. The R-STIGMA in the present sample demonstrated good internal consistency (Cronbach’s $\alpha = 0.90$).

Procedure

Recruitment emails were sent to a number of national teams, training groups at the Umeå Centre for Sports Sciences, elite level sport clubs, and individual athletes that fulfilled the inclusion criteria. Those athletes and clubs that replied, indicating their interest in participating were forwarded a link to a websurvey provided via Textalk. Additionally, local elite athletes were
provided the opportunity to complete the questionnaires using paper and pencil. The instructions provided to athletes in the questionnaire packs requested they base their answers on reflection of the last two weeks.

Data analysis

Statistical analyses were performed using IBM SPSS Statistics 23.0. Reliability for each measure was assessed with Cronbach’s α. To examine the relationships between the constructs (HADS-D, HADS-A, MTDS and R-STIGMA) Pearson bivariate correlational analysis was used. To further investigate the relationship between depression and overtraining linear regression analysis was performed and model fit measured with $R^2$. To compare means between different groups such as gender and sport (individual versus team) independent samples t-tests were used, effect sizes were measured using Cohen’s $d$. Regarding if the athletes previously had sought help and differences between groups Chi² tests were performed and effect sizes presented with the $\eta^2$-value.

A total of three missing responses were found in the dataset. When analyzed, these responses were considered missing at random and replaced with mean values (Tabachnick & Fidell, 2014).

To test if equal variances between two groups could be assumed, Levene’s test was used. When equal variances could not be assumed, the degrees of freedom were reported accordingly (i.e. when the degrees of freedom are adjusted).

Ethical considerations

The athletes participating in the study were provided written information about the nature of the study project, they were informed participation was voluntary and they could discontinue their participation at any time. Informed consent was provided by participants prior to completing the questionnaires. Participants were assured that their involvement in the study was confidential and anonymous; data in the study were coded to ensure it could not be identified with individual participants. Raw data was stored on a USB stick in a locked filing cabinet at the university. When working with the files on a computer the authors used a password protected unit.

Results

All the measurements showed some aspect of skewness and kurtosis, however these were within an acceptable range (Skewness ranged from 0.16 to 0.98. Kurtosis ranged from -0.44 to 1.05; George & Mallery, 2011).

Sample characteristics

In order to determine the frequency of athletes reporting symptoms of anxiety, scores on the HADS-A were examined using the criteria outlined by Zigmond and Snaith (1983), participants with scores equal to or greater than eight points were considered to be showing symptoms of anxiety. In the present sample 36 % ($M = 6.75, SD = 3.60$) of the athletes reported signs and symptoms of anxiety. An independent samples t-test revealed that women reported more anxiety than men ($t(98)=-2.38, p < 0.05, d = 0.52$). Further, athletes in team sports reported higher scores on anxiety than individual athletes ($t(98)=-2.78, p < 0.05, d = 0.56$).

The elite athletes in the study reported a mean score of 34.46 on the MTDS ($SD =13.32$), with higher scores indicating more symptoms of overtraining. Women reported higher scores than men ($t(78.02)=-2.17, p < 0.05, d = 0.44$). Athletes in team sports reported higher scores on the MTDS than individual athletes, ($t(96.65)=-2.25, p < 0.05, d = 0.45$).
Main results

The aim of the study was to investigate the prevalence of depression within the elite athlete population in Sweden. In order to determine the frequency of athletes reporting depression symptoms, scores on the HADS-D were examined using the criteria outlined by Zigmond and Snaith (1983). Participants with scores equal to or greater than eight points were considered to be meeting the criteria for depression. In this study 15% of the athletes meet the criteria for depression, the overall mean scores of depression within the sample was $M = 4.09$ ($SD = 3.20$). The hypothesis that the prevalence of depression in the sample comprising the study would reflect similar levels observed in the general population was supported. In the present sample 6.25% of male athletes and 19.12% of female athletes met the criteria for depression. The difference of depression incidence between genders was approaching statistical significance ($X^2(1, N = 100) = 2.83, p = 0.09, \eta^2 = 0.17$). Further analysis revealed that team athletes reported greater symptoms of depression than individual athletes, the difference in scores was approaching statistical significance ($t(97.98) = -1.80, p = 0.08$).

To examine the potential relationship between depression and overtraining, a bivariate correlation was performed. Athletes reporting high levels of overtraining also scored high on depression ($r(98) = 0.70, p < 0.01$). The expected result that athletes reporting symptoms of overtraining would also report symptoms of depression was supported. Further, to investigate how depression may predict overtraining linear regression analysis were conducted. The analyses revealed that depression significantly predicted overtraining. Depression also explained a significant proportion of variance in overtraining ($R^2 = 0.49, F(1, 98) = 94.74, p < 0.01$). To further examine the potential relationship between depression and overtraining, a comparison of depressed athletes (i.e., those scoring 8 or greater) with non-depressed athletes (i.e., those scoring 7 or less) on MTDS scores was undertaken. An independent samples t-test ($t(98)= 5.93, p < 0.05$) revealed that depressed athletes ($M = 50.67, SD = 12.12$) showed significantly greater symptoms of overtraining than the non-depressed athletes ($M = 31.60, SD = 11.37$).

To more closely scrutinize the observed relationship between depression and MTDS, and to ensure that the depressed mood subscale in the MTDS did not distort previously reported findings due to multicollinearity accounting for the observed correlation with depression, an adapted overtraining score on the MTDS was created where the depressed mood-subscale was excluded. Bivariate correlational analysis revealed that there was a significant relationship between scores on the adapted MTDS and depression ($r(98) = 0.64, p < 0.01$), meaning that athletes scoring high on depression also scored greater in terms of overtraining. The scores on the adapted MTDS were also used in linear regression analysis, where depression statistically predicted the adapted MTDS scores ($\beta = 0.64, t(98) = 8.13, p = 0.00$). Depression also explained a significant proportion of the variance in the adapted MTDS and showed a moderate fit ($R^2 = 0.40, F(1, 98) = 66.14, p < 0.01$).

Additional analyses revealed that training hours and years participating in the sport did not relate significantly with overtraining or depression.

To explore the potential of related variables predicting overtraining, regression analyses were conducted. The summary of the regression analysis are presented in Table 2.
An additional aim of the study was to explore athletes’ perspectives of potential stigmas associated with views of help seeking for mental health issues. This was examined through a number of analyses; in particular athletes’ scores on a stigma scale were scrutinized to examine how they felt about disclosing mental health problems. Specifically, reports of athletes previously seeking help for mental health problems and how likely it was that they would seek help for mental health problems were examined.

The athletes comprising the sample in the present study reported a mean score of 18.88 (SD = 7.35) points on the R-STIGMA. To examine if athletes reporting greater symptoms of depression or overtraining also reported higher levels of stigma, bivariate correlations were performed. Analyses revealed significant correlations between stigma and depression, \( r(98) = 0.21, p < 0.05 \) as well as between stigma and overtraining, \( r(98) = 0.21, p < 0.05 \). The expected result, that athletes reporting greater symptoms of depression or overtraining would report higher levels of stigma was supported. Athletes’ views on help seeking were further explored, 31 % of participants reported that they previously had sought professional help for mental health problems. Additionally, 45 % of participants reported that it was unlikely or extremely unlikely that they would seek help for mental health problems.

Of the participants in the present study, 12.5 % of male athletes and 39.7 % of female athletes reported that they previously had sought help for mental health problems. To investigate if female athletes are more help seeking than male athletes Chi-square tests were performed \( \chi^2(1, N = 100) = 7.53, p = 0.00, \eta^2 = 0.27 \), suggesting there was a significant difference between genders.

To examine whether there was a gender difference regarding the likelihood of help seeking, an independent samples t-test was performed \( t(98) = 2.67, p < 0.01, d = 0.56 \). The analysis revealed that it was more unlikely that female athletes would seek help for mental health problems than their male counterparts.

A summary of the response distribution regarding the likelihood of help seeking is presented in Table 3.

Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADS-A</td>
<td>0.86</td>
<td>0.08</td>
<td>0.73**</td>
</tr>
<tr>
<td>HADS-D</td>
<td>0.93</td>
<td>0.10</td>
<td>0.70*</td>
</tr>
</tbody>
</table>

Note. \( R^2 = 0.66 \) for the variables combined; adj. \( R^2_{adj} = 0.65 \) for the variables combined. **. Significant at the 0.01 level (2-tailed). *. Significant at the 0.05 level (2-tailed).
Table 3
*Response distribution in percent on the question “How likely is it that you would seek help for mental health problems if you were to experience them?” for male and female athletes.*

<table>
<thead>
<tr>
<th>Likelihood (Help seeking)</th>
<th>Total (%)</th>
<th>Male (%)</th>
<th>Female (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely likely</td>
<td>17.00 %</td>
<td>25.00 %</td>
<td>13.24 %</td>
</tr>
<tr>
<td>Likely</td>
<td>23.00 %</td>
<td>37.50 %</td>
<td>16.18 %</td>
</tr>
<tr>
<td>Neither likely nor unlikely</td>
<td>15.00 %</td>
<td>9.38 %</td>
<td>17.65 %</td>
</tr>
<tr>
<td>Unlikely</td>
<td>39.00 %</td>
<td>21.88 %</td>
<td>33.82 %</td>
</tr>
<tr>
<td>Extremely unlikely</td>
<td>6.00 %</td>
<td>6.25 %</td>
<td>5.88 %</td>
</tr>
</tbody>
</table>

An independent samples t-test ($t(98) = -2.06, p < 0.05, d = 0.41$) revealed that athletes in team sports reported higher levels of stigma than athletes in individual sports.

There was a significant positive correlation between help seeking and disclosure of stigma ($r(98) = 0.39, p < 0.01$) suggesting that athletes who would seek help also have higher stigma.

**Discussion**

The lack of discourse of mental health problems among elite athletes is of concern since it promotes stigma which in turn could lead to athletes refraining from seeking help. There is limited research on mental health and elite athletes, previous research has mostly been focused on the more “typical” athlete disorders such as eating disorders and substance abuse (Reardon & Factor, 2010). Previous studies have suggested that depression and overtraining are similar concepts (e.g. Morgan et al., 1987; Schwenk, 2000). Help seeking among elite athletes have been the subject of a few studies, most of a qualitative nature (e.g. Gulliver et al., 2012). Stigma, help seeking and how they relate to depression and overtraining has however never before been subject to investigation. The aim of the thesis was to investigate the prevalence of depression within the elite athlete population and examine the potential relationship between depression and overtraining, in addition to exploring athletes’ views on help seeking.

In the present study, a strong relationship between overtraining and depression was observed; this indicates a potential overlap between the two concepts. Further, almost half of the athletes in the sample reported that it was unlikely or extremely unlikely that they would seek help for mental health problems.

In the present study 15% of the athletes met the criteria for depression (Zigmond & Snaith, 1983). Compared to the Swedish lifetime prevalence of 15% for men and 25% for women (Socialstyrelsen, 2016) the prevalence rates were corresponding. The results are also in accordance with the prevalence range (6-43% in the general population) presented in the meta-analysis made by Gorczynski et al. (2017). The results of the present study indicate that there is no difference between elite athletes and the general population in relation to the prevalence of depression. According to Gorczynski and colleagues (2017) females are more likely to report depressive symptoms than their male counterparts, the results of the present study suggest this is also the case within athlete populations.
In contrast to Nixdorf et al.'s (2016) findings it was team sport athletes that reported greater symptoms of depression than individual sport athletes with this difference approaching statistical significance (i.e., $p = 0.08$). In Nixdorf and colleagues' study, internal attribution was forwarded as the explanation for the findings. The concept of internal attribution was beyond the scope of the present study. A reflection that can be made is that a large proportion of the team athletes was at the end of their season, meaning the end of a long and intense training period which according to Morgan et al. (1987) could lead to elevated mood scores. In contrast, a large proportion of the individual athletes were in the beginning of their season. Their mood scores should, according to Morgan and colleagues, be at baseline levels. This is one potential explanation as to why team athletes report more symptoms of depression than individual athletes.

Depression significantly predicted overtraining and depressed athletes showed significantly more symptoms of overtraining than non-depressed athletes. These findings are in accordance with Morgan et al.'s (1987) findings that as many as 80% of athletes that reported to be overtrained also exhibited clinically significant depression. In light of this, Schwenk’s (2000) argument that a distinction between overtraining and depression is difficult to determine is further illustrated with the results of the present study. Even though there are many co-occurring characteristics between depression and overtraining, the onset of overtraining vary greatly from that of depression. With this in mind, perhaps it would be more appropriate for research to specifically focus upon the concepts that overlap between them. In support of this contention, when the depressed mood-subscale was excluded from the MTDS, analyses remained significant and further highlighted the overlap between the concepts when controlling for potentially confounding measurement issues.

Depression and anxiety excited a strong explanatory value in relation to overtraining. Anxiety had the greatest explanatory value of overtraining. A possible explanation of this finding could be that anxiety is a concept that more closely relates to the different subscales in the MTDS than depression.

In the present study, no relationship between overtraining or depression with training hours was found. Other studies have indicated that when training loads rise in volume or intensity so too does mood disturbances. In consideration of the present study’s results, it would appear that training hours is not a useful measure regarding training load. This is also consistent with the findings of Gould et al. (1996). Another possible explanation is that the interindividual variation highlighted by Meeusen et al. (2013) suggests that the measure is not responsive enough to detect an effect. Meeusen and colleagues also point out that the sole causative factor of overtraining is not training, and this could also be an explanation to the non-significant results observed in the present study.

It is not possible to draw conclusions on the prevalence rate of overtraining in the present sample as an established instrument for detecting overtraining does not currently exist (Meeusen et al., 2013). The MTDS scale has demonstrated good reliability and validity and in conjunction with other physiological/biological measures it could be used for detecting overtraining (Main & Grove, 2009). It is worth noting that the correlation observed between depression and overtraining (i.e., depressed athletes showing more symptoms of overtraining than the non-depressed athletes) taken together with past research on mood and overtraining (e.g. Morgan et al., 1987) highlights that a decrease in mood (e.g. depression) is a warning sign for overtraining.

Athletes reporting greater symptoms of depression or overtraining also report higher levels of stigma. These relationships are of note as athletes experiencing problems with their mental health also do not want to disclose these problems. One possible explanation could be that athletes who experience symptoms of depression or overtraining are also the ones who are risking their position on the team or having to withdraw from the sport if they would have to disclose the information to persons within the sport context (Bauman, 2016). Thus, the coach has a very important role to play. He/she can both act as a barrier to help seeking by being the
person who decides the future for the athlete or an encouragement by exhibiting positive attitudes towards help seeking (Gulliver et al., 2012). Furthermore since athletes have a tendency to minimize signs of weakness (Reardon & Factor, 2010), the argument can be made that the more problems an athlete experience with their mental health, the more the athlete feel the need to hide it, especially from people within the sport context.

In the examination of athletes’ views on help seeking 31% of participants report that they previously had sought professional help for mental health problems. The results are positive because the participants are young, and Rickwood et al. (2007) point out that young people have a reluctance towards seeking help. Female athletes report more past help seeking than their male counterparts. In regards to intentions to seek help for mental health problems the results are reversed; it was observed that female athletes were less likely to seek help than male athletes. Taken together the results related to gender and help seeking somewhat contradict each other. This could be due to a methodological issue with the help seeking questions implying there is a difference between actual help seeking in the past and intent to seek help in the future. Perhaps adding follow-up questions to the measures on help seeking could have worked as a countermeasure. Further qualitative studies are suggested on help seeking in order to give us more answers on the subject. Taken together, 45% of participants reported that it was unlikely or extremely unlikely that they would seek help for mental health problems suggesting that almost half of athletes have a negative attitude towards seeking help. It is important to elucidate the factors underlying this trend particularly as perceived stigma has been reported as one of the dominant barriers for athletes seeking help for mental health problems (Gulliver et al., 2012). This negative attitude towards help seeking is worth highlighting. If athletes are refraining from seeking help and thus not receiving the appropriate treatment it could have serious implications.

Athletes in team sports reported higher levels of stigma than athletes in individual sports. The daily life as a team athlete where your friend is also in some way a competitor, peer pressure and not wanting to risk their place on the team (Bauman, 2016) if they disclose their problems could play a role. Interestingly, athletes who reported they would seek help also reported higher stigma. One possible explanation lies within the notion that it is very different to seek help where there is a possibility to remain anonymous and significant others associated with sport (e.g. teammate or coach) will not be aware of this disclosure of mental health problems; implications for future sport careers can be minimized with appropriate help seeking (Gulliver et al., 2012). Understanding the mechanisms underlying this reasoning in elite athletes is clearly important.

The lack of acknowledgement of mental health issues among elite athletes can also render negative feelings towards seeking appropriate help. The findings that athletes who report greater symptoms of depression or overtraining also experience more stigma against disclosing are of concern. It adds to mental health issues being repressed, which might lead to the perception that mental health problems does not exist in the elite athlete community and ultimately to other athletes/teammates not seeking help.

The question what can be done to increase help seeking still remains. Distributing relevant information to health care personnel so that they no longer minimize the existence of mental health symptoms in elite athletes due to the old notion that they cannot be unhealthy is important. Learning about the early warning signs of mental health problems as well as overtraining is important. With a knowledge and understanding of mental health problems and overtraining it is more difficult for athletes to ignore both their own or other teammates problems. When establishing a new culture within a team/club on views on mental health and help seeking it is important that the initiative come from the top of the organisation and are anchored with all personnel at every stage. Positive attitudes of others, especially from the coach and encouragement from other athletes could create a safe environment for disclosing (Gulliver et al., 2012).
It has been proposed that it is easier for athletes to seek help for overtraining rather than depression (Gulliver et al., 2012). The lack of acknowledgment of mental health issues as well as stigma could be explanations for why athletes perceive this solution as easier. Overtraining is not considered a mental health problem but rather performance related, making it the preferred choice over depression. Since the symptoms for depression and overtraining are very similar it is very important to make the correct diagnosis. If an athlete turns to their mental coach or physiotherapist rather than a licensed psychologist it could be problematic and ultimately lead to the person not receiving the appropriate help (Psykologförbundet, 2011).

The focus of research on overtraining today is predominantly aimed at identifying biological markers to detect overtraining (Kreher, 2016); however, this does not help athletes who are already suffering from overtraining. The state of being overtrained is associated with a drop in performance that can be equated to being injured, and injured athletes are in the danger zone for depression (Gouttebarge et al., 2016). Even if there is no established treatment for overtraining it is still important to treat the mood symptoms of overtraining and other negative effects (e.g. not being part of the team, self esteem) of overtraining (Armstrong & Vanheest, 2002; Bauman, 2016). These symptoms can be seen as secondary to overtraining but it is of course of utmost importance to treat them.

A holistic view is necessary in understanding the cause and effect of mental health problems such as overtraining and depression, and especially in treating these conditions (Armstrong & Vanheest, 2002; Bär & Markser, 2013). Sport specialization in health care is required in order to meet the needs of elite athletes (Bär & Markser, 2013). It is the authors opinion that a licensed psychologist oriented towards sport can prevent, detect and treat both depression and symptoms of overtraining. To date, Umeå university is the only university in the world which provides a MSc Psych for working as a licensed psychologist oriented towards sport.

Elite athletes can experience problems with their mental health just like anyone. Hopefully they will overcome the stigma and seek help, and in so doing, creating a greater demand for sport specific health care.

Training and competing at an elite level is not necessarily healthy since it puts a lot of pressure on the athlete both physically and mentally (Bauman, 2016). Our results indicate that elite athletes experience depression to the same extent as the general population. Physical exercise (at an optimal intensity) can have a preventive effect on depression and is recommended as a treatment for the general population in Sweden (Socialstyrelsen, 2016). The existence of the condition of overtraining proves that the relationship between physical activity and its effects are complicated. The relationship has an end point where exercise is even considered harmful. This occurs when strenuous physical activity leads to overreaching without the necessary recovery, a condition that could lead to overtraining. A potential trap for the elite athlete in search of supercompensation.

Limitations/strengths of the study and further research

Socially desirable responding may have affected the answers that were reported in the data collected via paper and pencil measures given the proximity of the researcher (i.e., collecting the questionnaire directly). Participants were assured that their reports were anonymous and no information would be disclosed to the coach or team members. The research design meant that the study was mainly correlational in nature, therefore causal implications cannot be drawn from the findings. In this study, no further inquiries as to from whom the athlete had sought help was made, supplementary studies making this inquiry is therefore necessary. A strength of the study was the number of elite athlete participants and their representation of a wide variety of sports. There was also an even distribution of team and individual athletes. The novel focus on stigma and help seeking and how they related to depression and overtraining is considered a strength of the study.
The results regarding help seeking and more specifically, athletes having previously sought help versus future help seeking were somewhat conflicting. Help seeking and stigma surrounding mental health in elite athletes needs to be further researched in order to understand its underlying mechanisms. Further research on overtraining is much needed. Especially the concept of athlete burnout should be explored together with overtraining and depression.

Conclusion

The findings emerging from the present study highlight that elite athletes experience depression to the same extent as the general population. Of note, an overlap between overtraining and depression was identified; given the high levels of stigma associated with athletes reporting greater symptoms of depression or overtraining further research is warranted to improve physical and mental health. The potentially severe implications of mental health problems among elite athletes necessitates the associated issues be addressed. Making the general public more aware of antecedents and outcomes will help to create a more open environment where elite athletes feel more confident in seeking help and prevent tragic events making current headlines.
References


