Est. 1841 | YORK ST JOHN UNIVERSITY

Lundkvist, E, Gustafsson, H, Madigan, Daniel J., Hjälm, S and Kalén, A (2022) The prevalence of emotional exhaustion in professional and semiprofessional coaches. Journal of Clinical Sport Psychology, 17 (4). pp. 376-389.

Downloaded from: https://ray.yorksj.ac.uk/id/eprint/5876/

The version presented here may differ from the published version or version of record. If you intend to cite from the work you are advised to consult the publisher's version: https://doi.org/10.1123/jcsp.2021-0039

Research at York St John (RaY) is an institutional repository. It supports the principles of open access by making the research outputs of the University available in digital form. Copyright of the items stored in RaY reside with the authors and/or other copyright owners. Users may access full text items free of charge, and may download a copy for private study or non-commercial research. For further reuse terms, see licence terms governing individual outputs. Institutional Repositories Policy Statement

RaY

Research at the University of York St John

For more information please contact RaY at ray@yorksj.ac.uk

Lundkvist, E., Gustafsson, H., Madigan, D. J., Hjälm, S., & Kalén, A. (in press). The prevalence of emotional exhaustion in professional and semiprofessional coaches. *Journal of Clinical Sport Psychology.*

The prevalence of emotional exhaustion in professional and semiprofessional coaches

Erik Lundkvist[1], Henrik Gustafsson[2,3], Daniel Madigan[4], Sören Hjälm[5], and Anton Kalén[6,7]

[1]Department of Psychology, Umeå University

[2]Department of educational studies, Karlstad University

[3]Department of coaching and psychology, Norwegian School of Sport Science

[4]School of Science, Technology and Health, York St John University

[5]School of Örebro University, School of Health Sciences

[6]Faculty of Education Sciences & Sports, Vigo University

[7]School of Informatics, University of Skövde

Corresponding author: Erik Lundkvist

Email: erik.lundkvist@umu.se

Abstract

The present study examined levels of emotional exhaustion, a key symptom of burnout, in Swedish professional and semiprofessional sport coaches in comparison to the normative values specified in the Maslach Burnout Inventory manual (MBI; Maslach, Jackson & Leiter, 1996) as well as in comparison to the clinical cut-offs developed by Kleijweg et al. (2013). The sample contained 318 Swedish coaches (*M* age = 42.7 years, 12% female) working at least 50% full time from both team (60%) and individual (40%) sports. Our study shows that in general coaches in this sample experience lower average levels of exhaustion than normative samples both regarding the MBI and clinical cut-offs. Two groups of coaches did, however, stand out. Coaches living in single households as well as coaches working part time had higher risk of severe levels of emotional exhaustion. These results place coach exhaustion levels in relation to other occupations and highlight that in this sample the coaching profession does not stand out as more emotionally exhausting than other occupations.

Keywords: Burnout, sport coaching, elite sport, stress

Introduction

Burnout has been studied in relation to sport coaches for almost 40 years (Goodger et al., 2007; Olusoga, Bentzen, & Kenttä, 2019) and the knowledge base continues to grow year-on-year. Most often research focuses on possible antecedents as well as detailed descriptions of individual's experiences of stress, stressors, and burnout within the coaching environment (Goodger et al., 2007). Studying coaches in relation to stress and burnout is important because coaching itself involves high-performance goals (Bentzen, Lemyre, & Kenttä, 2017), job insecurity (Bentzen, et al., 2020; Lundkvist et al., 2012), and high workload that stem from a 24/7 mentality in elite sport (Lundkvist et al., 2012).

Burnout has several definitions, but the most common is based on Maslach's work-related three-dimensional conceptualization (Maslach et al., 1986). The first dimension comprises experiences of emotional exhaustion (Schaufeli & Enzmann, 1998; Schaufeli & Buunk, 2003; Shirom, 2005). The second dimension is depersonalization/cynicism, which is the development of a cynical attitude towards one's job or those involved in one's job. The final dimension is reduced efficacy which comprises feelings of not being able to be productive at work (Leiter & Maslach, 2003). Although the multidimensional definition of burnout is the most common in occupation burnout literature (e.g., Maslach et al., 2001), there is some disagreement about how to define burnout and the validity of the three dimensions have been criticized (cf. Gustafsson, et al., 2016; Kristensen, Borritz, Villadsen, & Christensen, 2005; Lundkvist, Gustafsson, & Davis, 2015; Shirom, 2005). There is, however, a consensus that exhaustion is a key dimension, and one that is common across various models of burnout (Schaufeli & Buunk, 2003; Schaufeli & Enzmann, 1998; Shirom, 2005). In examining the antecedents and correlates of burnout, measuring all three dimensions is important, however, in the current study, where the focus is on clinically relevant symptoms, we focus on exhaustion and do so because there is evidence that measuring exhaustion allows

one to discriminate between whether people are clinically burned out or not (Kleijweg, Verbraak, & Van Dijk, 2013; Roelofs, et al., 2005).

Coach Exhaustion Prevalence

Despite the relatively large number of studies conducted on coach burnout, burnout prevalence, including emotional exhaustion, is rarely investigated. For example, in the most recent review on coach burnout, prevalence or incidence is not mentioned (Olusoga et al., 2019). This suggests that prevalence has not been of interest in sport burnout research for some time (Madigan et al., 2019). Averages and/or distributions of afflicted coaches have, however, been compared to persons working in other occupations outside of sports. In these studies, it appears that average emotional exhaustion levels are lower than in other occupations (Apostolidis, 2012; Caccese & Mayerberg, 1984; Dale & Weinberg, 1989; Hjälm et al., 2007; Hunt, 1983; Hunt & Miller, 1994; Pastore & Judd, 1993; Price & Weiss, 2000; Raedeke, 2004; Raedeke et al., 2000; Ryska, 2009; Tashman et al., 2010; Vealey et al., 1992) as well as lower percentages with high risk of emotional exhaustion (Karabatos, et al., 2006; Kelley, 1994; Kelley et al., 1999; Kelley & Gill, 1993). However, these studies only provide brief descriptions of these issues and variability in these estimates have not been accounted for in their statistical analysis (e.g., no credibility or confidence intervals). Such knowledge regarding similarities with other working populations as well as any specificities unique to sport coaching would be profitable both within the research community and from an applied perspective. Consequently, further study of this issue in coach burnout research is warranted.

Methods to Determine Prevalence

In terms of quantifying burnout levels, for coach research, the Maslach Burnout Inventory (MBI) has been the most popular measure (Goodger et al., 2007; Olusoga et al., 2019). The MBI is also the most popular measure in occupational psychology (Shirom, 2005). Even though the use of MBI have been critically discussed both in coach contexts (Lundkvist,

Gustafsson, & Davis, 2016; Lundkvist et al., 2014) and in occupational and clinical contexts (Shirom, 2005; Shirom & Melamed, 2006) the extensive use of this measure has provided general cut-off points and normative reference data from several different occupations which can be used to compare exhaustion levels across occupations (Maslach, Jackson, & Leiter, 1996). Originally, the general cut-off points were created by dividing a sample of 11,000 people from different occupations into equally large thirds (low, average, or high). For the exhaustion subscale, from a minimum sum score of 0 to a maximum of 54 (or 6 for an average score), a score of under 16 is considered low (M = 1.78), a score between 17-26 is considered average (M = 1.89 – 2.89), and a score over 27 is considered high (M = 3.00). Maslach et al. (1996) also developed cut offs for occupational subgroups where social services has the highest cut off for the high group (≥ 28) and mental health occupations had the lowest cut off for the high group (≥ 21). These reference categories give information on how occupations differ in exhaustion levels and could potentially set the coaching profession in perspective compared to other working populations (Lundkvist et al., 2016).

What this categorization does not give us is information on how many coaches are at risk of suffering clinical complications due to burnout. In this regard, there are several studies showing that the emotional exhaustion dimension can discriminate between clinically burnt out and healthy individuals reasonably well (Kleijweg, Verbraak, & Van Dijk, 2013; Roelofs, et al., 2005). To do so, Kleijweg et al. (2013) provided a clinical cut-off level for the emotional exhaustion dimension (31.50 when using a sum score, 3.50 for an average) and Roelofs et al. (2005) provided a somewhat higher cut-off (41.40 when using a sum score, 4.60 for an average). The cut-offs for Kleijweg et al. (2013) and Roelofs et al. (2005) were derived by comparing one sample of patients suffering from stress related mental health issues and a comparison sample of patients that were evaluated to be healthy by a clinical psychologist. A clinical cut-off does, however, come with several problems. The most prominent problem is

that there will inevitably be individuals who are miscategorized. That is, there will be people in a sample from a working population that will be over the clinical cut-off who may not be suffering complications from their symptoms and in a group of patients suffering from exhaustion disorder or clinical burnout there will be people who will be under the clinical cut-off even if they suffer complications from their symptoms. It is therefore reasonable to believe that there will be persons in a healthy group that are over the clinical cut-off. Reasons for misclassification could, for example, be that people semantically interpret questions differently (Arnulf et al., 2014).

For the MBI, both clinical validity and miscategorization have been debated. One sudy has shown that missclassification for MBI can be as large as 57% (Schaufeli et al, 2001). This was, however, based on the whole sample and a clear clinical cut-off was not used. In the other two studies, the mis-categorization was not accounted for (Kleijweg, Verbraak, & Van Dijk, 2013; Roelofs, et al., 2005). Previous work comparing burnout patients with healthy controls using the Shirom Melamed Burnout Questionnaire suggests that the intersection of the distribution from the clinical sample and control group is approximately 14.50%. This means that 14.50% of the controls scored over the clinical cut-off for burnout (Lundgren-Nilsson, et al., 2012). Even if misclassification is not the optimal way to study whether a sample contains more or less people over or under a certain value of a self-reported questionnaire compared to the use of clinical interviews, it provides an indication of the percentage of healthy people that score over the clinical cut-off.

The Present Study

It is against this background that our aim with the present study was to examine whether sport coaches differ in levels of the emotional exhaustion component of burnout when compared to people working in other occupations, as well as comparing levels of coaches who reach clinical cut-offs for exhaustion. We focused on the exhaustion subscale

because of the evidence for its utility from a clinical and cut-off perspective (e.g., Kleijweg, et al., 2013; Roelofs, et al., 2005). The specific research questions we aimed to test therefore were: (1) to determine whether coaches are more exhausted than individuals from the general working population following the normative values of Maslach et al. (1996) and (2) to determine whether sport coaches are more exhausted in regards of clinical cut-off values than general working populations. To do so, we used the clinical cut-off level of 31.50 from Kleijweg et al. (2013) and utilised the liberal estimate from previous data from the MBI and we assumed that 14.50% mis-categorized over the cut-off is standard in a healthy working population (Lundgren-Nilsson et al., 2012). Based on previous work in this area (Apostolidis, 2012; Pastore & Judd, 1993; Vealey et al., 1992), we hypothesized that the present coaching sample would show lower levels of exhaustion when compared to working populations based on the normative values and clinical cut-offs.

Methods and Design

Participants and procedure

Data in this study were taken from a Swedish sample of coaches that coached as their full- or part-time profession. Data was collected via a web survey based on websurveycreator.com with two reminder emails. Contact information came from co-operations with the Swedish Sports Confederation and the Swedish Football Association. In total, the survey was distributed to 645 coaches with a 52% response rate. For those who wanted (N = 71), a paper survey was distributed via regular mail. Those invited to participate comprised the total sample of all coaches working as coaches in Swedish sport high schools, and the total sample of coaches in the two highest football leagues for men and the highest league for women.

The total sample contained 336 coaches (12% female; 85% married or living with partner) with a mean age of 42.71 (SD = 9.76) years. In total, 36 different sports were

represented in the sample: 40% were individual sports (for example, athletics, cross-country skiing, alpine skiing, and orienteering) and 60% were team sports (for example, football, floorball, ice hockey, and basketball). Of these, 29% coached at the professional level (coaching in the premier or second division or being a national team coach). The remainder of the sample contained a majority of coaches, defined as semiprofessional, working in high schools (71%) where youth that strive to reach world class performance practice their sport as part of everyday school (Ferry et al., 2013). Furthermore, the majority worked as full-time coaches (59%), some worked between 26 to 79 percent of full time (32%) and a small number worked less than 25 percent (6%). To ensure that our sample and prevalence data was based on coaches with at least 25% of their time spent coaching, we removed 18 coaches' data. The final sample size was therefore $N = 318$. Data for semiprofessional coaches was gathered during winter and spring meaning that it was collected in different parts of their competitive seasons. Since they work in schools all were within practice season. For professional football coaches, data was collected at the end of the season.

Exhaustion measure

Emotional exhaustion was measured using the emotional exhaustion subscale from the coach version of the MBI (Maslach, et al. 1996). This version is an adaption of the educator version of the MBI where the measure is contextualized to the coaching context (e.g., "I feel fatigued when I get up in the morning and have to face another day on the job"; Vealey et al., 1992). Questions are answered on a seven-point scale from zero (*never*) to six (*every day*). In the present study the reliability of the subscale based on internal consistency was adequate (Cronbach's $\alpha = .87$).

Statistical analysis

To estimate the probability that a participant is categorized at low, medium, or high risk of emotional exhaustion, as well as the probability a participant is similar to a healthy

working sample for the clinical cut-off, we used a Bayesian binomial regression with flat priors (Paulino, Soares, & Neuhaus, 2003). The mean probability of participants belonging to each group, with 95% Confidence Intervals, are presented, together with the probability of being higher and lower than the expected values. The expected values were based on the normative values from MBI manual divided in three equally large groups (Maslach et al., 1996). For the clinical cut-off, we used 14.50% as the normative value of a healthy sample to be over the cut-off based on previous comparisons between healthy and clinical samples (Lundgren-Nilsson et al., 2012). We also analyzed associations between the variables from the subgroups (gender, civil status, level, and percentage of work time in total).

Since the emotional exhaustion score has a theoretical minimum and maximum (0-54), we transformed the data to a 0-1 scale. Meaning that the response is a proportion of the possible exhaustion score (e.g., score 54 = 1, score 27 = .5). The appropriate way to model this kind of proportion data is to use a beta regression (Liu & Kong, 2015). Beta regressions cannot handle scores of absolute 0 or 1, therefore the proportion was transformed using the formula (exhaustion score * (n-1) + 0.5/n; Smithson & Verkuilen, 2006). We used flat priors because we did not possess strong prior subject knowledge and therefore avoided overconfidence in the results.

To estimate statistical credibility, probability of direction (*pd*) was used. This statistic is strongly correlated with the frequentist *p*-value, and can thus be used to draw parallels and give some reference to readers non-familiar with Bayesian statistics. A two-sided *p*-value of respectively .1, .05, .01 and .001 would correspond approximately to a *pd* of .95, .975, .995 and 1.00. Thus, for convenience, we suggest the following reference values as interpretations (Makowski, et al., 2019): *pd* <= .95 ~ p > .1: uncertain, *pd* > .95 ~ p < .1: possibly existing, *pd* > .97: likely existing, *pd* > .99: probably existing and *pd* > .999: almost certainly existing.

All analysis was performed in R Version 4.0.3 and the brms package was used to fit models in STAN (Bürkner, 2017). The models were estimated using a Hamiltonian Monte Carlo algorithm with four chains, each with 4,000 warm-up and 4,000 sampling iterations (Betancourt & Girolami, 2015).

Results

Descriptive statistics including median, mean, minimum, and maximum from the whole sample as well as grouped by gender, sporting level, individual or team sport and the amount of total working hours are presented in Table 1. Comparisons between the coaching sample to the normative values from the MBI are presented fully in Table 2.

MBI normative distributions

The whole sample was overrepresented in the low group (54%) compared to the comparison estimates of 33.33%. Most subgroups were also overrepresented in the low group compared to norm values (range 44 to 69%) of 33.33%. Three groups differed from this trend. Coaches working less than 60 percent were underrepresented (18%). Coaches living in single households (44%) and professional coaches (37%) were similar to the comparison group with an equal distribution of 33.3%.

For the average group, the whole sample was similar (30%) to the comparison group. For subgroups most groups had proportions that were similar to the comparison group (range 30 to 39%). Female coaches (23%), semiprofessional coaches (27%) and individual sport coaches (20%) were underrepresented.

For the high-risk norm group the total sample (15%) was underrepresented compared to the norm values of 33.33%. For subgroups they generally were underrepresented (range 8 to 24%). Coaches working less than 60 percent of full time were overrepresented (52%). Coaches living in single person households did not differ from the norm population (30%).

MBI clinical cut-off

Comparisons between our coaching sample and the estimated value of 14.50% being over the clinical cut-off for the MBI are presented in Table 3. For the whole sample, the coaches were underrepresented (7%) for being over the clinical cut-off compared to the set estimate of 14.50%. For subgroups the majority were underrepresented over the clinical cut off estimate (range 5-7%). Two groups were similar to the estimate, coaches living in single person households (18%) and coaches working less than 60 percent of full time (18%).

Variables associated with group membership

All results from the beta regressions can be seen is Table 4. The univariate regression models showed that the probability of male coaches, single household coaches and team sport coaches almost certainly had a proportion of overrepresentation of high exhaustion scores whereas semiprofessional coaches and coaches working full time (more than 80%) almost certainly had an underrepresentation of high exhaustion scores compared to the full sample. In the multivariate regression model including all subgroup variables, male coaches, semiprofessional coaches and team coaches were no longer over or underrepresented. Coaches in single households still had a proportion that showed overrepresentation of high exhaustion and the group working full time still had a proportion that were almost certainly an underrepresentation of high exhaustion scores.

Discussion

The present study aimed to examine whether sport coaches (professional and semiprofessional) differed in levels of the emotional exhaustion component of burnout when compared to people working in other occupations, as well as comparing levels of coaches who reach clinical cut-offs for exhaustion. Our findings suggested that coaches in our sample had lower probabilities to be in the high-risk group (upper third) or clinical cut-off group than general work populations (Lundgren-Nilsson et al., 2012). This would suggest that our

hypothesis that coaches would have lower levels of exhaustion than other occupations was supported. Looking at specific subgroups, two groups stood out from our sample. Coaches working between 50-60 percent of full time were overrepresented in the high-risk group and coaches in single households were similarly distributed in the high-risk group. Neither group was, however, overrepresented based on the clinical cut offs.

The present findings suggest that the coaching profession in Sweden, on average, may be at less risk of emotional exhaustion than comparable populations. Other studies, most often but not always, using American samples have found similar results (Apostolidis, 2012; Pastore & Judd, 1993; Vealey et al., 1992). Similarly, in a Scandinavian, in which Sweden is a part, context, Bentzen (et al., 2016) saw similar trends even if this was not the main aim of that study. Comparable trends have been seen for athletes as well (Gerber et al., 2018; Küttel et al., 2021; Reardon et al., 2019). Within the sample, semiprofessional coaches seemed to score lower than professional coaches. It is, however, worth emphasizing that professional coaches in our sample were still not over-represented in groups indicating higher exhaustion risk (high or clinical cut-off) than other populations and in the multivariate beta regression the within sample overrepresentation was not evident when all variables were included in the model. This would indicate that this was explained by other variables rather than being a professional coach per se. Further, similar results were shown for coaches living in single households whom on average more likely to be in the high-risk group than those living with a partner or being married. Previous studies have shown that having a family – and therefore social support – may buffer exhaustion, we note however that these associations could also be complex for coaches since stress within the family can be interpreted differently (Lundkvist, et al., 2016).

Even if our study shows that the exhaustion scores in general are low, this does not mean that coaches are not susceptible to exhaustion. The results should instead be interpreted

to indicate that, based on our sample, choosing a coaching profession might not be different from choosing jobs in other work areas in terms of exhaustion prevalence. Further research using other coaching populations, contexts, better control of actual positions and countries is however needed to generalize the findings more broadly.

Although they were not extreme in their exhaustion, it is a bit puzzling that coaches who worked fewer hours had higher levels of exhaustion. One possible explanation is that in fact (certain) individuals in this group work less because they have felt exhausted or that they work less since they are recovering from higher levels of burnout (Grossi et al., 2015). This issue is indicative of a kind of "healthy worker effect" (coaches who are suffering from the highest levels of exhaustion did not complete the survey because they are absent due to their exhaustion related sick leave (Schaufeli et al., 1998) or even, in our case, a "recovering worker effect" (coaches who did take part are recovering from high levels of exhaustion). Alternatively, as earlier studies have shown, when coaches have unclear roles that are combined with pressures from other areas (e.g., other jobs) they may exhibit higher exhaustion scores (Hjälm et al., 2007). Thus, coaches working part-time in coaching, may have additional demands that increase their risk of exhaustion. Overall, these issues would suggest that it is possible our sample resulted in an underestimate of the higher levels of exhaustion. The collection of data on coach absence (e.g., absenteeism) would be a very useful addition to future work in this area to help further unpick these issues.

Limitations

The present study has several limitations. First, the cross-sectional design meant that we may not have been able to capture the variability in exhaustion over time (Lundkvist et al., 2018). This is particularly important in relation to the time of year for coaches, where competition periods are inevitably more stressful for some coaches with higher exhaustion levels at the end of the season (T1, $M = 1.69$, $SD = 1.07$; T2 $M = 1.9$, $SD = 1.21$; Bentzen et

al., 2016). It is, however, worth mentioning that the mean was still lower than normative mean from the MBI (M = 2.10; Bentzen et al., 2016). Second, using clinical cut-offs for a measure instead of clinical interviews increases the risk of misspecification, as a trained psychologist or psychiatrist can more thoroughly evaluate the symptoms described in their evaluation tool (Targum, 2011). Third, we do not have data on how those coaches who have multiple jobs combine these jobs and if that might affect exhaustion levels which has been shown before in Swedish elite contexts (Hjälm et al, 2006). Fourth, our use of a convenience sample means that our findings may lack generalizability, this is also the case in relation to professional coaches who were mainly from football. The study should therefore be replicated in other contexts with random and more heterogenous samples. Finally, our study focused exclusively on the emotional exhaustion component of burnout. Future work should therefore examine whether the same pattern of findings applies to other burnout symptoms, and do so as a priority.

Conclusions, future studies and practical implications

This study has a number of practical implications. The first being that if a person is thinking of becoming a coach, at least in Sweden, there appears to be a similar risk of becoming burned out or more exhausted as in other occupations. There are however many other issues like long and inconvenient working hours that still exist in the coaching profession that may differ from other occupations. Based on the findings from the current study showing that coaches express rather low signs of emotional exhaustion, future research should not only investigate potential stressors, but also how positive aspects of the coaching profession might be protective factors for the development of exhaustion. We also suggest that descriptive statistics are presented where the cut-offs from Maslach et al. (1996) are added for reference to readers as well as researchers conducting meta-analyses and other summary studies. As stated before, we do know that the findings from this study only give one

suggestion on the prevalence of exhaustion and our findings combined with similar findings from other studies both in coaching and for athletes (Apostolidis, 2012; Gerber et al., 2018; Küttel et al., 2021; Pastore & Judd, 1993; Reardon et al., 2019; Vealey et al., 1992) at least to some extent underline that how we research burnout in sport might need to change to better align with the potential problems that comes from burnout. As seen in our and other studies the prevalence is not zero and for individuals' high levels of exhaustion can be extremely problematic. Learning about associations (longitudinal or not) in observational designs where most coaches are not at any risk for clinical exhaustion will not necessarily provide much practical knowledge to the coaching community. Especially if, as this and several other studies point out, these associations are studied in mainly healthy samples. Therefore, we suggest more work needs to be focused on determining the means to prevent burnout development for persons at risk. Interventions to do so could include resources to handle stress and exhaustion and evaluate how organizations can work to decrease burnout risk in coaches and other employees. Also, trying to determine the implications from exhaustion and/or burnout should be prioritized. One common example is that burnout might be a cause for withdrawal from sport, and so from a burnout perspective this needs to be researched in more detail. Finally, because the contextual differences between the coaching occupation and other occupations might not be that large, it is possible to use frameworks from well-grounded larger RCTs on burnout in other occupations when looking for potential evidence in coach burnout prevention as well as treatment. Doing so would provide important knowledge for applied work in helping coaches handle stress as well as guiding future burnout research.

References

Apostolidis, N. (2012). An examination of a burnout model in basketball coaches. *Journal of Physical Education & Sport, 12*(2).

Arnulf, J. K., Larsen, K. R., Martinsen, Ø. L., & Bong, C. H. (2014). Predicting survey responses: how and why semantics shape survey statistics on organizational behaviour. *PLoS One, 9*(9), e106361. https://doi.org/10.1371/journal.pone.0106361

Bentzen, M., Kenttä, G., Richter, A., & Lemyre, P.-N. (2020). Impact of job insecurity on psychological well-and ill-being among high performance coaches. *International Journal of Environmental Research and Public Health, 17*(19), 6939.

Bentzen, M., Lemyre, N., & Kenttä, G. (2017). A comparison of high-performance football coaches experiencing high-versus low-burnout symptoms across a season of play: Quality of motivation and recovery matters. *International Sport Coaching Journal, 4*(2), 133-146.

Bentzen, M., Lemyre, P.-N., & Kenttä, G. (2016). Development of exhaustion for high-performance coaches in association with workload and motivation: A person-centered approach. *Psychology of Sport and Exercise, 22*, 10-19.

Betancourt, M., & Girolami, M. (2015). Hamiltonian Monte Carlo for hierarchical models. *Current Trends in Bayesian Methodology with Applications, 79*(30), 2-4.

Bürkner, P.-C. (2017). Advanced Bayesian multilevel modeling with the R package brms. *Arxiv Preprint Arxiv:1705.11123*.

Dale, J., & Weinberg, R. S. (1989). The Relationship between Coaches' Leadership Style and Burnout, *The Sport Psychologist*, *3*(1), 1-13.

Eisen, E. A., Picciotto, S., & Robins, J. M. (2014). Healthy worker effect. *Wiley StatsRef: Statistics Reference Online*. https://doi.org/10.1002/9781118445112.stat07615

Gerber, M., Best, S., Meerstetter, F., Walter, M., Ludyga, S., Brand, S., . . . Gustafsson, H. (2018). Effects of stress and mental toughness on burnout and depressive symptoms: A prospective study with young elite athletes. *Journal of Science and Medicine in Sport, 21*(12), 1200-1205. https://doi.org/10.1016/j.jsams.2018.05.018

Goodger, K., Gorely, T., Lavallee, D., & Harwood, C. (2007). Burnout in sport: A systematic review. *The Sport Psychologist, 21*(2), 127-151.

Grossi, G., Perski, A., Osika, W., & Savic, I. (2015). Stress-related exhaustion disorder–clinical manifestation of burnout? A review of assessment methods, sleep impairments, cognitive disturbances, and neuro-biological and physiological changes in clinical burnout. *Scandinavian Journal of Psychology, 56*(6), 626-636.

Hjälm, S., Kenttä, G., Hassmenan, P., & Gustafsson, H. (2007). Burnout among elite soccer coaches. *Journal of Sport Behavior, 30*(4).

Kleijweg, J. H., Verbraak, M. J., & Van Dijk, M. K. (2013). The clinical utility of the Maslach Burnout Inventory in a clinical population. *Psychological Assessment, 25*(2), 435.

Küttel, A., Pedersen, A. K., & Larsen, C. H. (2021). To flourish or languish, that is the question: Exploring the mental health profiles of Danish elite athletes. *Psychology of Sport and Exercise, 52*, 101837.

Larner, R. J., Wagstaff, C., Thelwell, R., & Corbett, J. (2017). A multistudy examination of organizational stressors, emotional labor, burnout, and turnover in sport organizations. *Scandinavian Journal of Medicine & Science in Sports, 27*(12), 2103-2115.

Leiter, M. P., & Maslach, C. (2003). Areas of worklife: A structured approach to organizational predictors of job burnout. In *Emotional and physiological processes and positive intervention strategies* (pp. 91-134): Emerald Group Publishing Limited.

Liu, F., & Kong, Y. (2015). zoib: An R Package for Bayesian Inference for Beta Regression and Zero/One Inflated Beta Regression. *R J., 7*(2), 34.

Lundgren-Nilsson, Å., Jonsdottir, I. H., Pallant, J., & Ahlborg, G. (2012). Internal construct validity of the Shirom-Melamed Burnout questionnaire (SMBQ). *BMC Public Health, 12*(1), 1.

Lundkvist, E., Gustafsson, H., & Davis, P. A. (2016). What is missing and why it is missing from coach burnout research. In *The psychology of effective coaching and management.* (pp. 407-427). Hauppauge, NY, US: Nova Science Publishers.

Lundkvist, E., Gustafsson, H., Davis, P. A., Holmstrom, S., Lemyre, N., & Ivarsson, A. (2018). The temporal relations across burnout dimensions in athletes. *Scand Journal of Medicine and Science in Sports, 28*(3), 1215-1226. doi:10.1111/sms.13000

Lundkvist, E., Gustafsson, H., Hjälm, S., & Hassmén, P. (2012). An interpretative phenomenological analysis of burnout and recovery in elite soccer coaches. *Qualitative Research in Sport, Exercise and Health, 4*(3), 400-419.

Lundkvist, E., Stenling, A., Gustafsson, H., & Hassmén, P. (2014). How to Measure Coach Burnout: An Evaluation of Three Burnout Measures. *Measurement in Physical Education and Exercise Science, 18*(3), 209-226. doi:10.1080/1091367X.2014.925455

Madigan, D. J., Gustafsson, H., Smith, A., Raedeke, T., & Hill, A. P. (2019). The BASES expert statement on burnout in sport. *The Sport and Exercise Scientist, 61*, 6-7.

Makowski, D., Ben-Shachar, M. S., Chen, S., & Lüdecke, D. (2019). Indices of effect existence and significance in the Bayesian framework. *Frontiers in Psychology, 10*, 2767.

Maslach, C., Jackson, S. E., Leiter, M. P., Schaufeli, W. B., & Schwab, R. L. (1986). *Maslach Burnout Inventory* (Vol. 21). Consulting psychologists press Palo Alto, CA.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach Burnout Inventory Manual* (Vol. 4): Consulting psychologists press Palo Alto, CA.

Olusoga, P., Bentzen, M., & Kenttä, G. (2019). Coach burnout: A scoping review. *International Sport Coaching Journal, 1*, 1-21.

Pastore, D. L., & Judd, M. R. (1993). Gender differences in burnout among coaches of women's athletic teams at 2-year colleges. *Sociology of Sport Journal, 10*(2), 205-212.

Paulino, D,-C., Soares, P., & Neuhaus, J. (2003). Binomial regression with misclassification. *Biometrics, 59*(3), 670-675.

Reardon, C. L., Hainline, B., Aron, C. M., Baron, D., Baum, A. L., Bindra, A., . . . Currie, A. (2019). Mental health in elite athletes: International Olympic Committee consensus statement (2019). *British Journal of Sports Medicine, 53*(11), 667-699.

Roelofs, J., Verbraak, M., Keijsers, G. P., De Bruin, M. B., & Schmidt, A. J. (2005). Psychometric properties of a Dutch version of the Maslach Burnout Inventory General Survey (MBI-DV) in individuals with and without clinical burnout. *Stress and Health: Journal of the International Society for the Investigation of Stress*, *21*(1), 17-25.

Schaufeli, W. B., Bakker, A. B., Hoogduin, K., Schaap, C., & Kladler, A. (2001). On the clinical validity of the Maslach Burnout Inventory and the Burnout Measure. *Psychology & health*, *16*(5), 565-582.

Schaufeli, W., & Enzmann, D. (1998). *The burnout companion to study and practice: A critical analysis*: CRC press.

Schaufeli, W. B., & Buunk, B. P. (2003). Burnout: An overview of 25 years of research and theorizing. *The handbook of work and health psychology, 2*(1), 282-424.

Shirom, A. (2005). Reflections on the study of burnout. *Work & Stress, 19*(3), 263-270.

Shirom, A., & Melamed, S. (2006). A comparison of the construct validity of two burnout measures in two groups of professionals. *International journal of stress management, 13*(2), 176.

Smithson, M., & Verkuilen, J. (2006). A better lemon squeezer? Maximum-likelihood regression with beta-distributed dependent variables. *Psychological Methods, 11*(1), 54.

Targum S. D. (2011). The Distinction between Clinical and Research Interviews in Psychiatry. *Innovations in Clinical Neuroscience*, *8*(3), 40–44.

Thelwell, R. C., Weston, N. J., Greenlees, I. A., & Hutchings, N. V. (2008). Stressors in elite sport: A coach perspective. *Journal of Sports Sciences, 26*(9), 905-918.

Vealey, R. S., Udry, E. M., Zimmerman, V., & Soliday, J. (1992). Intrapersonal and situational predictors of coaching burnout. *Journal of Sport and Exercercise Psychology, 14*(1).

Table 1.

Descriptive statistics for exhaustion in total sample and sub groups

	N	Mean (SD)	Median (ICR)	Min	Max
Total sample	318	16.39 (9.12)	15 (14)	0	48
Female	37	14.59 (7.89)	13 (10.5)	4	34
Male	271	16.74 (9.31)	16 (14)	0	48
Married/partner	268	15.88 (8.74)	15 (13)	0	42
Single	44	19.64 (11.09)	18 (17)	5	48
Elite	97	19.04 (8.75)	20 (12)	1	37
High school	220	15.27 (9.06)	14 (13)	0	48
Individual	125	14.35 (8.97)	12 (12)	0	42
Team	192	17.77 (8.97)	18 (13.50)	1	48
<60%	35	23.31(9.99)	23 (13)	4	48
>80%	282	15.53 (8.65)	15 (13)	0	42

Note. The group with coaches working between 61-80% were removed because it was too small.

Table 2

Probabilities and probability of direction for being over or under the clinical cut-off compared MBI norm values

	Low		Average		High	
	Prob 95% CI	pd	Prob 95% CI	pd	Prob 95% CI	pd
All	.54 [.49, .60]	↑ 1.00	.30 [.26, .36]	↓ .87	.15 [.11, .19]	↓ 1.00
Gender						
Female	.69 [.55, .83]	↑ 1.00	.23 [.11, .36]	↓ .93	.08 [.01, .16]	↓ 1.00
Male	.52 [.46, ,58]	↑ 1.00	.32 [.46, .58]	↓ .75	.16 [.12, .21]	↓ 1.00
Civil status						
Married*	.56 [.50, .62]	↑ 1.00	.31 [.25, .37]	↓ .79	.13 [.09, .17]	↓ 1.00
Single	.44 [.30, .59]	↑ .93	.25 [.13, .39]	↓ .88	.30 [.18, .44]	↓ .68
Sport level						
Elite	.37 [.28, .47]	↑ .78	.39 [.29, .49]	↑ .84	.24 [.16, .33]	↓ .97
HS^	.61 [.55, .68]	↑ 1.00	.27 [.22, .33]	↓ .98	.12 [.07, .16]	↓ 1.00
Type of sport						
Individual	.67 [.60, .76]	↑ 1.00	.20 [.13, .27]	↓ 1.00	.11 [.06, .16]	↓ 1.00
Team	.46 [.39, .53]	↑ 1.00	.37 [.30, .43]	↑ .83	.18 [.13, .23]	↓ 1.00
Weekly work						
<60%	.18 [.06, .31]	↓ .98	.30 [.15, .45]	↓ .66	.52 [.35, .68]	↑ .98
>80%	.58 [.53, .64]	↑ 1.00	.30 [.25, .36]	↓ .86	.11 [.07, .15]	↓ 1.00

Note. pd shows Probability of Direction where ↑ indicate a probability that the groups are larger than 33.33% and ↓ indicate a probability of the group being smaller than 33.33%.
*Married also include those living togheter with their partner. ^HS = high school.

Table 3

Probabilities and probability of direction for being over or under the clinical cut-off compared to a normal population

	Prob 95% CI	pd
All	.07 [.04, .09]	↑ 1.00
Female	.05, [.00, .12]	↑ .98
Male	.07 [.04, .10]	↑ 1.00
Married/partner	.05 [.02, .07]	↑ 1.00
Single	.18 [.08, .30]	↓ .74
Elite	.07 [.02, .12]	↑ .99
High school	.07 [.04, .10]	↑ 1.00
Individual	.07 [.03, .12]	↑ 1.00
Team	.06, [.03, .10]	↑ 1.00
<60%	.18 [.06, .31]	↓ .68
>80%	.05 [.03, .08]	↑ 1.00

Note. Pd shows the Probability of direction where ↑ indicate a probability that the groups are larger than 85.5% and ↓ indicate a probability of the group being smaller than 14.5%.

Table 4.
Beta regressions for associations between subgroups and exhaustion scores

	Individual models			Total model		
	Estimate	95% CI	*pd*	Estimate	95% CI	*pd*
Male	.10	[-.17, .37]	.77	-.02	[-.30, .26]	.56
Single	.33	[.08, .57]	1.00	.31	[.06, .56]	.99
Highschool	-.32	[-.50, -.14]	1.00	-.07	[-.30, .16]	.74
Team	.33	[.15, .50]	1.00	.27	[.05, .16]	.74
80% work grp	-.63	[.89, -.37]	1.00	-.57	[-.87, -.29]	1.00

Note. Estimate = log odds ratio