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Profiles of Mental Well- and Ill-Being among Elite Athletes: Associations with Sport-Related Demands and Resources

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Abstract

The aim of the present study was to identify profiles of elite athlete mental well- and ill-being and study how the profiles (i.e., subgroups of athletes) differed in sport-related demands and resources. A total of 259 Finnish elite athletes ($n = 170$ active; $n = 89$ retired) completed quantitative self-report inventories. Through cluster analysis, four profiles of mental well- and ill-being were identified. Profile 1 was overrepresented by retired, older, and male athletes and characterized by good mental well-being. Profile 2 consisted mainly of active athletes who reported mild risk for alcohol abuse. Profile 3 consisted mainly of women who displayed possible presence of an eating disorder. Profile 4 was typical of young athletes with mental ill-being. The balance between sport-related demands and resources appeared to be the healthiest in Profile 1 and worst in Profile 4. The present findings are beneficial for those who work with and/or provide psychological support to athletes.

Keywords: Elite athletes, mental well-being, mental health symptoms, mental ill-being, sport-related demands, sport-related resources

Profiles of Mental Well- and Ill-Being among Elite Athletes: Associations with Sport-Related Demands and Resources

Over the recent decade, elite athlete mental well- and ill-being has gained traction in both popular media and academic literature (e.g., Doherty et al., 2016; Souter et al., 2018). In addition to many high-profile athletes opening about their mental health struggles in the media (Souter et al., 2018), existing reviews of empirical evidence have also demonstrated that athletes, alike to general population, experience myriad of mental ill-being such as depression, anxiety, eating disorders, and substance abuse (e.g., Gouttebarger et al., 2019; Reardon et al., 2019; Rice et al., 2016).

A range of biopsychosocial stressors and demands have been found to have the potential to negatively affect elite athlete mental well-being (Hughes & Leavey, 2012; Nixdorf et al., 2016). Some stressors and demands include: extensive training load (Rice et al., 2016), overtraining (Kuettel & Larsen, 2020), injury (Wolanin et al., 2015), pressure to perform (Noblet et al., 2003), poor athletic performance (Prinz et al., 2016; Reardon, 2017), poor coach-athlete and/or athlete-athlete relationships (Prinz et al., 2016), travel and subsequent separation from family and friends (Rice et al., 2016), and unsuccessful transition out of sport (Bruner et al., 2008; Esopenko et al., 2017). While the aim(s) and methodologies of the above research vary, a commonality across the existing elite athlete mental well-being research exists. Much of the research has predominantly focused on identifying and understanding the presence and symptoms of mental ill-being or disorders, often referred to as mental ill-being (Rice et al., 2016), rather than the presence of factors that comprise mental well-being. Such approach, by default, defines mental well-being as the absence of mental health symptoms (i.e., mental ill-being) rather than as a state of well-being.

Our research aims to address this gap. By aligning our research with World Health Organization's definition of mental well-being, "a state of well-being in which every

individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community” (World Health Organization, 2014, para. 1), our purpose is to explore mental well- and ill-being profiles among elite athletes, and how these profiles may be associated with sport-related demands and resources. Consistent with the WHO definition, our research defines mental well-being as a malleable state, where an individual has an awareness of their existing ill-being (i.e., presence of mental health symptoms), well-being (i.e., realization of personal potential), sport-related demands (i.e., stressors), and resources (e.g., social support).

Our research also recognizes that mental well-being is typically approached from two distinct perspectives. Hedonistic perspective emphasizes *subjective well-being*, which is characterized by maximizing one's feeling of pleasure and satisfaction with life and occasionally, equated with happiness (Diener, 1984). In contrast, eudaimonic perspective focuses on *psychological well-being*, which refers to actualizing one's human potentials and formulating positive human functioning, giving meaningfulness and purpose in life (Ryff, 1989; Ryff & Keyes, 1995). Thus far, research has found that satisfaction in sport, intrinsic interest in sport, and self-worth (Lundqvist, 2011; Reinboth & Duda, 2006) are all related to athlete mental well-being. While the psychological constructs associated with subjective and psychological well-being correlate with each other, evidence also suggest that the two approaches are empirically distinct (Keyes et al., 2002). To account for the differing perspectives described above, our research measures mental well- and ill-being in three distinct ways: subjective mental well-being (i.e., life satisfaction), psychological mental well-being (i.e., positive functioning), and mental ill-being (i.e., depression, anxiety, potential presence of an eating disorder, risk for alcohol abuse).

Lastly, and consistent with the WHO definition of mental well-being, our research acknowledges range of resources as protective in elite athlete mental well-being. These

factors have been studied more seldom than risk factors, probably because ill-health and related factors have been the main target of athlete mental health studies to date (Kuettel & Larsen, 2020). In their review, based on nine reviews/meta-analyses and 43 empirical primary research studies, Kuettel and Larsen (2020) identified several personal and sport-environmental resources as protective factors for mental well-being. Some of the personal resources included positive supportive relationships, appropriate recovery, feeling of competence related to sport success, and career satisfaction. Identified sport-environmental resources included having a trusting and mastery-oriented sport climate, confidential and trusting relationship with the coach, social support from the sport environment, and successful adjustment to sport retirement.

In summary, existing elite athlete mental well-being research has been focused on exploring the absence and/or presence of mental ill-being, as opposed to presence of mental well-being. Consistent with the WHO definition of mental well-being, our research aims to address this gap by profiling elite athlete subjective and psychological mental well-being in conjunction with their self-reported absence and/or presence of mental ill-being. We also aim to explore the relationships between the identified mental well- and ill-being profiles and selected sport-related demands and resources as identified in the existing literature.

Method

Participants

A total of 259 self-identified Finnish elite athletes participated in the study. Of the athletes, 64% ($n = 166$) identified as female and 36% ($n = 93$) as male. All participants were 18 years or older (age range 18–65 years). The largest age groups were: 19–24 (31%, $n = 81$), 25–34 (25%, $n = 65$) and 35–44 (14%, $n = 36$). Of the participants, 13% ($n = 34$) were under 19 years of age, 10% ($n = 25$) were 45–54, and 7% ($n = 18$) were aged 55 and over. Participants represented a total of 31 individual and/or team sports (e.g., baseball, figure

skating, football, swimming). Sport representation varied from $n = 1$ participants (e.g., dressage and weightlifting) to $n = 47$ (ice hockey). Of the participating athletes, 65% ($n = 168$) had won a medal at the European Championships, World Championships, or in the Olympic Games, and 79% ($n = 204$) had won a medal at the Finnish National Championships.

Of the sample, 66% were actively competing in their sport (referred to as active athletes; $n = 170$) and 34% had retired from competitive elite sport (referred to as retired athletes; $n = 89$). Of the retired athletes, 49% ($n = 44$) had retired from sports over ten years ago, and 15% ($n = 13$) had retired from their sport within a year of data collection. We included retired athletes as their experiences are important (Poucher et al., 2019) in understanding elite athlete mental well- and ill-being.

Procedure

Following the Ethics Committee approval, we approached the potential participants through various Finnish sport federations and sport organizations. The organization representatives were asked to send electronic invitations to their active and retired elite athlete members to participate in the study. These invitations included a brief introduction, an informed consent, and an URL link to the online survey that contained all the measures. Follow-up contacts with the representatives were made two times. The data were collected during Spring and Summer 2019 using Webropol-software.

Measures: Mental Well- and Ill-Being

We measured mental well-being with the presence of both subjective (life satisfaction) and psychological (positive functioning) well-being. We measured mental ill-being with measures identifying the presence of selected mental health symptoms and maladaptive behaviors (depression, anxiety, possible presence of eating disorders, and risk for alcohol abuse) associated with mental ill-being.

Subjective Well-Being: Life Satisfaction

We used the questions from the Finnish Health 2011 survey (Terveys, 2011) to measure subjective well-being (life satisfaction). These seven self-report questions (e.g., *how satisfied are you with your relationships* and *how satisfied are you with your health?*) were rated on a 6-point Likert scale (1 = *very dissatisfied* to 6 = *very satisfied*). We calculated a mean score (1–6) for the seven items.

Psychological Well-Being: Positive Functioning

We used the 18-item version of the Scales of Psychological Well-Being (Ryff, 1989) to measure participants' psychological well-being. The Finnish language version of the measure has demonstrated acceptable validity and reliability (Kokko & Feldt, 2018). The scale is a self-report questionnaire that measures six components of psychological well-being: self-acceptance, positive relationships with others, environmental mastery, autonomy, purpose in life, and personal growth. Each item (e.g., *I tend to dominate the current life situation; my life has been one of continuous learning, change and growth*) are rated on a 4-point Likert scale (1 = *strongly disagree* to 4 = *strongly agree*). In this study, the original structure of the construct could not be confirmed by Principal Component Analysis (PCA). Therefore, a mean score (1–4) consisting of all items was calculated to describe psychological well-being in a similar way as in the study by Kokko and Feldt (2018).

Depression

We measured depression with Beck Depression Inventory (BDI; Beck, 1972), a valid and reliable measure of depressive symptoms with Finnish general population (Aalto et al., 2012). The BDI is a 4-point Likert-scale (0 = *no depression* to 3 = *major depression*) self-report questionnaire with 21 statements about negative thoughts, feelings, and behavior (e.g., *sense of failure, feeling guilt, self-hate, loss of appetite, crying spells*). The BDI is scored by adding all items to a total score (0 - 63).

174 *Anxiety*

175 We measured anxiety with Beck Anxiety Inventory (BAI), a measure with
176 demonstrated validity and reliability (Beck et al., 1988). The BAI is a 4-point Likert-scale (0
177 = *not at all anxious* to 3 = *severe anxiety*) self-report questionnaire with 21 questions about
178 cognitive and somatic signs and symptoms of anxiety (e.g., *numbness, tingling and fear of the*
179 *worst happening*). The BAI is scored by adding all items to a total score (0 – 63).

180 *Eating Disorder(s)*

181 We screened the possible presence of eating disorders with the Finnish version of the
182 Questionnaire to Screen for Eating Disorders (SCOFF; Morgan, Reid & Lacey, 2000), which
183 has demonstrated validity in Finnish (Hautala et al., 2005). The SCOFF is a five-question
184 (e.g., *are you worried about the idea that you can no longer control how much you eat?*) self-
185 report questionnaire that screens for potential eating disorders on a dichotomous (1 = *yes*, 0 =
186 *no*) scale. The SCOFF is scored by adding all items to a total score (0 - 5).

187 *Alcohol (Ab)use*

188 We used the Audit-10 (Saunders et al., 1993) to document the participants' alcohol
189 consumption, drinking related behaviors, and alcohol related problems. The Audit-10 has
190 been found to provide an accurate measure of risk across gender, age, and cultures (for more
191 details on demonstrated validity, see Babor et al., 2001). Audit-10 is a 10-item, self-report
192 questionnaire that aims to determine if a person is at risk for alcohol abuse problems and
193 measures both the amount of alcohol consumed (two questions) and the harm related to
194 alcohol use (eight questions) on a 5-point Likert Scale (1 = *never* to 5 = *daily or almost*
195 *daily*). Audit-10 is scored by adding all items to a total score (0 - 40).

196 *Measures: Sport-Related Demands and Resources*

197 We measured sport-related demands and resources with a measure developed
198 specifically for the purpose of this research. The items used were derived from earlier

research (i.e., Fletcher & Wagstaff, 2009; Kaski, 2013; Rice et al., 2016) and previous clinical sport psychology practice. We used PCA with Promax Rotation to establish the sport-related demands and resources components used in the present study. Thus, we had a pool of items separately for demands and resources of which we searched with the help of PCA the most reliable items measuring each demand and resource.

Sport-Related Demands

Following PCA with Promax Rotation, three distinct sport-related demand components emerged: sport success-related pressures (3 items, e.g., *not being successful in sport would burden me*), overcommitment to sport (3 items, e.g., *sport is the only important matter in my life*), and sport-related worries (3 items, e.g., *I am worried about being injured or getting sick*). Each item was rated on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). A mean score (1-5) was computed for each demand.

Sport-Related Resources

PCA with Promax Rotation produced two distinct sport-related resource components: personal development (3 items, e.g., *I enjoy that sport challenges me as a person*) and satisfaction with coaching (3 items, e.g., *I am satisfied with my coach's way of coaching*). Each item was rated on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). A mean score (1-5) was computed for each resource.

The reliabilities (Cronbach alphas) for the measures are shown in Table 1. Overall, all measures demonstrated acceptable ($\alpha > .60$ -.70) reliability, with the exception of the measure for possible prevalence of an eating disorder demonstrated low reliability (.52).

Data Analysis

Descriptive statistics (frequencies, percentages, means, and standard deviations) were calculated for each of the study variables. Pearson correlation coefficients were computed to examine the relationships between the study variables. The first research aim, i.e., to explore

multidimensional mental well- and ill-being with a goal to capture distinct profiles (i.e., subgroups) of elite athletes, was examined by cluster analysis. We adopted a person-oriented perspective to our analysis with a goal to distinguish distinctly different, yet internally homogeneous psychosocial profiles among the elite athletes. For our analysis, we used two-step cluster analysis, a hybrid approach that first uses a distance measure to separate groups, followed by a probabilistic approach to choose the optimal subgroup model (Gelbard et al., 2007; Kent et al., 2014). The analysis automatically determines the optimal solution based on the chosen criterion. We used Bayesian Information Criterion (BIC); lower BIC values reflect better fit for a given cluster solution. In addition to the statistical criterion, it is also important to consider the content and interpretability of the cluster solution (e.g., Benassi, et al., 2020). Comparative studies have regarded two-step cluster analysis as one of the most reliable in terms of the number of subgroups detected, classification probability of individuals to subgroups, and reproducibility of findings in various types of data (Gelbard et al., 2007; Kent et al., 2014). The variables of mental well- and ill-being were standardized before entered to the cluster analysis because they were scored differently. The second research aim, i.e., to examine sport-related demands and resources and background factors that distinguish differences between the different mental well- and ill-being clusters (i.e., profiles) was examined in one of two ways: using robust variance analysis (Welch's *F*-test, continuous variables) or cross-tabulation and chi-square test (categorical variables). In the variance analysis, pairwise comparisons between the groups were examined with Games-Howell post hoc-test.

Results

Descriptive Results

Descriptive statistics, internal consistency scale reliabilities (Cronbach alphas) and Pearson correlation coefficients are reported in Table 1. The Pearson correlation coefficients

showed that mental ill-being measures (i.e., mental health symptoms) correlated positively with each other, except for possible presence of an eating disorder and risk for alcohol abuse. The strongest correlation ($r = .71$) was found for symptoms of depression and symptoms of anxiety. Mental ill-being measures also correlated negatively with life satisfaction and positive functioning, symptoms of depression showing the strongest correlation with life satisfaction ($r = -.66$) and positive functioning ($r = -.68$). In addition, all sport-related demands were statistically significantly associated with all mental well- and ill-being measures except for risk for alcohol abuse. The strongest correlations were found for sport-related worries and symptoms of depression ($r = .37$) and positive functioning ($r = -.43$). Of the sport-related resources, satisfaction with coaching was also found to have statistically significant relationship with mental well- and ill-being measures, except for risk for alcohol abuse. Satisfaction with coaching showed strongest correlations with depression ($r = -.23$) and positive functioning ($r = .30$).

Identifying Distinct Mental Well- and Ill-Being Profiles

A two-step cluster analysis proposed three clusters, with the lowest information criterion (BIC) being 892.995. These clusters differed from each other in mental well- and ill-being: one cluster presented with good mental well-being, one with mental ill-being, and one with an average mental well- and ill-being. When we compared BIC-values between three and four clusters, the change was small; the four-cluster solution had a BIC-value of 894.348. Examining the content of the four clusters, we found that one of the original clusters (average mental well- and ill-being) was divided into two distinct clusters: one cluster with mild risk for alcohol abuse, and another with a higher possible presence of eating disorders. As the four-cluster solution revealed interesting content differences and provided further information on elite athlete mental well- and ill-being when compared to the three-cluster solution, we considered it justified to select the four-cluster solution.

The four clusters (i.e., profiles) are displayed in Figure 1. The most frequent profile, Profile 1 (41.3%; $n = 107$) is characterized by good mental well-being, with notable absence of mental ill-being, and the highest levels of both subjective (life satisfaction) and psychological (positive functioning) well-being. Profile 2 (35.5%; $n = 92$) is characterized by average mental well- and ill-being with mild risk for alcohol abuse. Profile 3 (12.0%; $n = 31$) is characterized by average mental well- and ill-being, with possible presence of an eating disorder. The least frequent profile, Profile 4 (11.2%; $n = 27$) is characterized by mental ill-being, with the highest level of both symptoms of depression and anxiety, and the lowest level of both subjective and psychological well-being.

Distinguishing Differences Between the Mental Well- and Ill-Being Profiles

The four mental well- and ill-being profiles differed statistically significantly in terms of gender, age, and sport participation status (active, retired; Table 2). Profile 1 was overrepresented by males, individuals aged 45-54 years, and retired athletes. Profile 1 was also underrepresented by females, young (19-24) athletes, and active athletes. Profile 2 was overrepresented by active athletes (both male and female). Profile 3 had a significant overrepresentation of women, particularly those under 19 years of age. Only one male fit Profile 3. Profile 4 was overrepresented by young (19-24) athletes. In summary, the profiles indicate that women and young athletes were most likely to present mental ill-being.

The mental well- and ill-being profiles also differed significantly in sport-related demands and resources (see Table 3). Profile 1 exhibited significantly less sport-related demands. Athletes in Profile 1 reported less overcommitment to sport, fewer sport success-related pressures, and fewer sport-related worries than athletes in Profiles 2, 3, and 4. They also differed from other profiles by being most satisfied with coaching. In short, the balance between sport-related demands and resources appeared to be the healthiest. Profile 2 exhibited less sport-related demands than Profile 3 and 4. Athletes in Profile 2 appeared to

report less overcommitment to sport than athletes in Profile 3, and fewer sport success-related pressures, and fewer sport-related worries than athletes in Profile 4. Profile 3 reported less sport-related worries than athletes in Profile 4. Profile 4 exhibited the most sport-related demands, and least sport-related resources. Athletes in Profile 4 scored highest on sport success-related pressures and sport-related worries, of which the latter was significantly higher than in other profiles. With regards to sport-related resources, the only significant pairwise profile differences were found for satisfaction with coaching.

Discussion

The emergent four profiles are consistent with previous research on mental well-being profiles conducted with non-athlete populations (e.g., Keyes, 2005; Kokko & Feldt, 2018). Much like general population, most of the athletes in this research presented with average mental well- and ill-being, followed by athletes with good mental well-being (Profile 1). In our research, having an average mental well-being with presence of ill-being was characterized by either a mild risk of alcohol abuse (Profile 2) or a potential presence of an eating disorder (Profile 3). The mental ill-being profile (Profile 4) was the least frequent, finding that is also consistent research conducted with general populations (Keyes, 2005; Kokko & Feldt, 2018).

As expected, our results also found sport-related demands and resources as contributing to athlete mental well- and ill-being. Presence of sport-related demands was found to be more important in distinguishing the emergent mental well- and ill-being profiles than sport-related resources. The most balanced ratio of sport-related demands and resources were found in Profile 1, and least balanced ratio in Profile 4. Our results support existing literature (e.g., Bakker & Demerouti, 2017) and the notion that sport-related demands can deplete individuals' resources, and if left unmitigated, can lead to mental ill-being (i.e., mental health symptoms). Equally, sport-related resources can operate as an energizing and

replenishing process to enhance mental well-being and offset demands (see Kuettel & Larsen, 2020). For example, our research found that satisfaction with coaching (a resource) was a significant contributor to good mental well-being, supporting the notion that having a trusting, open, and supportive relationship(s) with coach(es) can protect athlete mental well-being (Bissett et al., 2020; Kuettel & Larsen, 2020).

In addition to the above expected differences, the sport-related demands and resources were more balanced for Profiles 2 and 3, both characterized by average mental well- and ill-being. Athletes in Profile 3 reported the highest level of overcommitment to sport while simultaneously enjoying personal development as an athlete at the highest level. This suggests that working hard with a goal to achieve high levels of performance and success was very important to athletes in Profile 3. Such thought and behavioral patterns can amplify risk of eating disorders, as it is known that commitment to excellence is among predisposing factors for eating disorders (Bratland-Sanda & Sundgot-Borgen, 2013).

Our results also suggest that athlete mental well- and ill-being is associated with gender, age, and sport participation status (active vs. retired). Good mental well-being profile (Profile 1) was more common for men than women, and the Profile 3 consisted mostly of young (< 19) women (with one man as an exception). This is consistent with previous research, in that female athletes have been found to score higher in mental ill-being than male athletes (e.g., Junge & Feddermann-Demont, 2016; Schaal et al., 2011). It is also known that young female athletes present with more eating problems than young male athletes (Bratland-Sanda & Sundgot-Borgen, 2013; Schaal et al., 2011; Sundgot-Borgen & Torstveit, 2004). It is important to note that those working with elite female athletes should be aware of how several factors can contribute to the development of an eating disorder. Some of these factors include involvement in sports where leanness and meeting a specific weight is important

(Sundgot-Borgen, 1993), early sport specialization, dieting, and perceived early puberty onset in relation to optimal performance (Sundgot-Borgen, 1994).

Although the relationship between age and mental well- and ill-being has not been frequently studied (Poucher et al., 2021), Schaal et al. (2011) found that prevalence of mental ill-being among older (>21) athletes was lower than among younger (< 17) athletes. This may suggest that as athletes age, they also gain more experience, which may help in the development of effective ways of coping with sport-related demands, thus resulting better stress management and stress recovery. This is further supported by our research, as Profile 1 included a greater share of older athletes, whereas Profile 4 included a greater share of younger athletes.

Our results also demonstrated a relationship between sport participation status (active vs. retired) and athlete mental well- and ill-being. Given the prevalence of retired athletes in Profile 1, it is possible that these athletes have had a healthy transition out of elite sport, resulting in good mental well-being. If so, these findings are promising, as it is known that transitioning out of elite sport can be challenging for athlete mental well-being (Bruner et al., 2008; Esopenko et al., 2017), particularly due to loss of social support networks (Park et al., 2013), and loss of athletic identity (Martin et al., 2014; Menke & Germany, 2019). Nevertheless, it is also possible that the retired athletes in our sample did not have a healthy transition out of sport, but during post-retirement they have had time to process their retirement experience and therefore feel mentally well. Our results also support the findings from a recent meta-analysis (Gouttebarga et al., 2019) in that the prevalence of mental ill-being (e.g., anxiety, depression) is higher among active than retired athletes. This was supported in our research, as Profile 1 (with higher number of retired athletes) with good mental well-being also reported less mental ill-being than athletes in the other three profiles, with a higher percentage of active athletes. More specifically, active athletes were

particularly overrepresented in Profile 2. While alcohol use can negatively impact performance and recovery, these results may be a reflection of active elite athletes being exposed to both generic demands and stressors (e.g., adverse life events) and sport-specific demands and stressors (Arnold & Fletcher, 2012). To cope with such demands and stressors, elite athletes may result in using alcohol as a means of relieving stress, or to cope with pain, and/or negative emotions (Reardon et al, 2019).

The current findings can be of benefit to athletes and those working in elite sport in multiple ways. First, identifying baseline mental well-and ill-being, as well as presence of sport-related demands and resources is paramount, to which regular subsequent re-assessments can be equated. Such process can identify individual athletes at risk of mental ill-being, by identifying symptoms of mental health problems, highlighting the absence of signs of mental well-being, and possible imbalances between existing sport-related demands and resources. Based on our findings, in addition to symptoms of depression and anxiety, early screening for and identifying signs of possible eating disorders among young female athletes, and the potential risk of alcohol abuse (even mild) among active athletes deserves attention. Second, our results also highlight the importance of ensuring active athletes have access to a team of professionals specialized in mental health, alcohol abuse, and eating disorders. Having such services regularly available to athletes, along with regular mental well- and ill-being assessment will enable early detection of signs of impaired mental well-being, as well as early referral to appropriate evidence-based intervention with a qualified professional.

Our results also highlight the significant role unidimensional athletic identity (i.e., the extent to which a person identifies with the athlete role), plays in elite athlete mental well-and ill-being. This was particularly prominent with athletes in Profile 3 and was apparent factor contributing to the ways in which athletes perceived their sport-related demands and resources. Athletes, coaches, and healthcare professionals working with athletes should be

aware of how athletic identity is reinforced within an elite sporting environment. Existing research has highlighted that strong unidimensional athletic identity can have a negative effect on active athletes' mental well-being (Doherty et al., 2016) as well as expose athletes to adjustment difficulties both during and post athletic retirement (Kuettel & Larsen, 2020). Ensuring a sporting environment that fosters the development of a multidimensional identity and commitment to several roles (e.g., athlete, student, child, or a spouse) is paramount and responsibility of both the athlete, their immediate sporting environment, and its social agents.

Our results are also of specific benefit to athletic coaches. According to Bissett et al. (2020), athletic coaches are in a key position to foster positive psychosocial development and mental well-being among athletes in three main ways: (a) by cultivating team environment that supports athlete mental health, (b) by normalizing mental health related care-seeking behaviors, and (c) by supporting athletes receiving mental health services. Moreover, athletic coaches can help athletes to shift focus from uncontrollable performance outcomes to more controllable process and performance improvement-related effort and standards, as such an approach has been found to mitigate performance related stressors and optimize sport participation (Reardon et al., 2019). This is particularly important for young elite athletes, who tend to focus on performance outcomes, are vulnerable to internalize problematic athletic identity from early sport experiences, and whose identity development is still in progress (Carless & Douglas, 2013).

In addition to athletic coaches, our findings also have implications to sport healthcare professionals such as physiotherapists, sport and performance psychologists, and sport administrators, to name a few. Each play a role in enhancing athlete performance, including the creation and implementation of strategies (and policies) aimed to help athletes balance sport-related demands and resources. Given our results, it is imperative that sport healthcare professionals, and sport administrators understand the role sport-related demands and

resources play in athlete mental well- and ill-being, particularly as it relates to their role in creating a sporting environment that helps minimize sport-related demands and provide access to appropriate resources. Such environment should also include considerations for pre-retirement planning and post-retirement support, as it has been found that athletes who have a pre-retirement plan in place prior to transitioning out of sport, are more likely to experience a healthy career transition, and thus exhibit better mental well-being post-retirement (e.g., Arvinen-Barrow et al., 2015; Arvinen-Barrow et al., 2019).

Despite the significant contributions our study is not without limitations. Due to our cross-sectional design, we are unable to draw conclusions implying causality. Our theoretical framework was grounded on the assumption that both risk (demands) and protective (resources) factors have a unidirectional relationship with athlete mental well- and ill-being, which, then, in turn interact in a bidirectional manner. It is, however, possible that mental ill-being, due to depleted personal resources, play a role in how an athlete perceives their sport-related demands and resources, thus suggesting that the reverse relationships are possible.

As our data was collected with the help of representatives from several Finnish sport organizations, we are unable to calculate response rate, or to know which athletes decided not to participate in the study. Thus, we do not know how representative the sample was, for example, in terms of mental well- and ill-being. As our sample included elite athletes from multiple sports, this can be considered an advantage in terms of generalizability of the findings. However, due to likely producing heterogeneity in the results, our sample can also be considered a limitation for generalizability of the results. In addition, since we focused only on elite athletes, our sample size limits our ability to identify potential sport-type differences in athlete mental well- and ill-being.

Future research should consider conducting more person-oriented research on athlete mental well- and ill-being. The main emphasis in person-oriented research is on the search

for robust emerging typical profiles (in our study athlete mental well- and ill-being profiles) and their meaningful connections, such as sport-related demands and resources (Bergman & Lundh, 2015). Future research could either replicate our research or extend it to focus on creating athlete mental well- and ill-being profiles over time, thus allowing the identification of possible changes/similarities in mental well- and ill-being indicators and sport-related demands and resources. Creating longitudinal research designs by including multiple time points for profile creation would provide a deeper understanding of how mental well- and ill-being develops over time at an intra-individual level.

Our research also included only selected sport-related demands and resources. We focused on sport-specific demands and resources, leaving out, for example, personal risk factors and resources (e.g., coping skills and perceptions of competence). To gain a more comprehensive understanding of athlete mental well- and ill-being, future research should consider examining a wider range of demands and resources. Future research should also focus on the development of comprehensive, valid, and reliable screening instruments that are both user-friendly (i.e., not too long) and specific to elite athlete population (see Gouttebauge et al., 2020). Such screening instruments should also include valid and reliable measures of clinical mental health symptoms and disorders, rather than rely solely on self-reported symptoms, like we did, which is a limitation of the present study. In addition, data gained from the screening instruments could be triangulated with an interview conducted by a clinical mental health professional appropriately trained to work with athletes.

Despite the above limitations, our study adds to the existing literature in number of ways. By aligning our research with WHO's definition of mental well-being and adopting a person-oriented approach in understanding athlete mental well- and ill-being, our research has highlighted four distinct profiles of mental well- and ill-being among elite athletes. The emergent mental well- and ill-being intricacies would have been missed had we used a

variable-oriented approach, which by default explores different mental well- and ill-being indicators in isolation. Our study adds to existing elite athlete mental health literature, with its ability to gain greater insight into the complexity of athlete mental well-being. More specifically, our research demonstrates how different mental well- and ill-being indicators form identifiable mental well- and ill-being profiles, and how selected sport-related demands and resources differentiate these emergent profiles.

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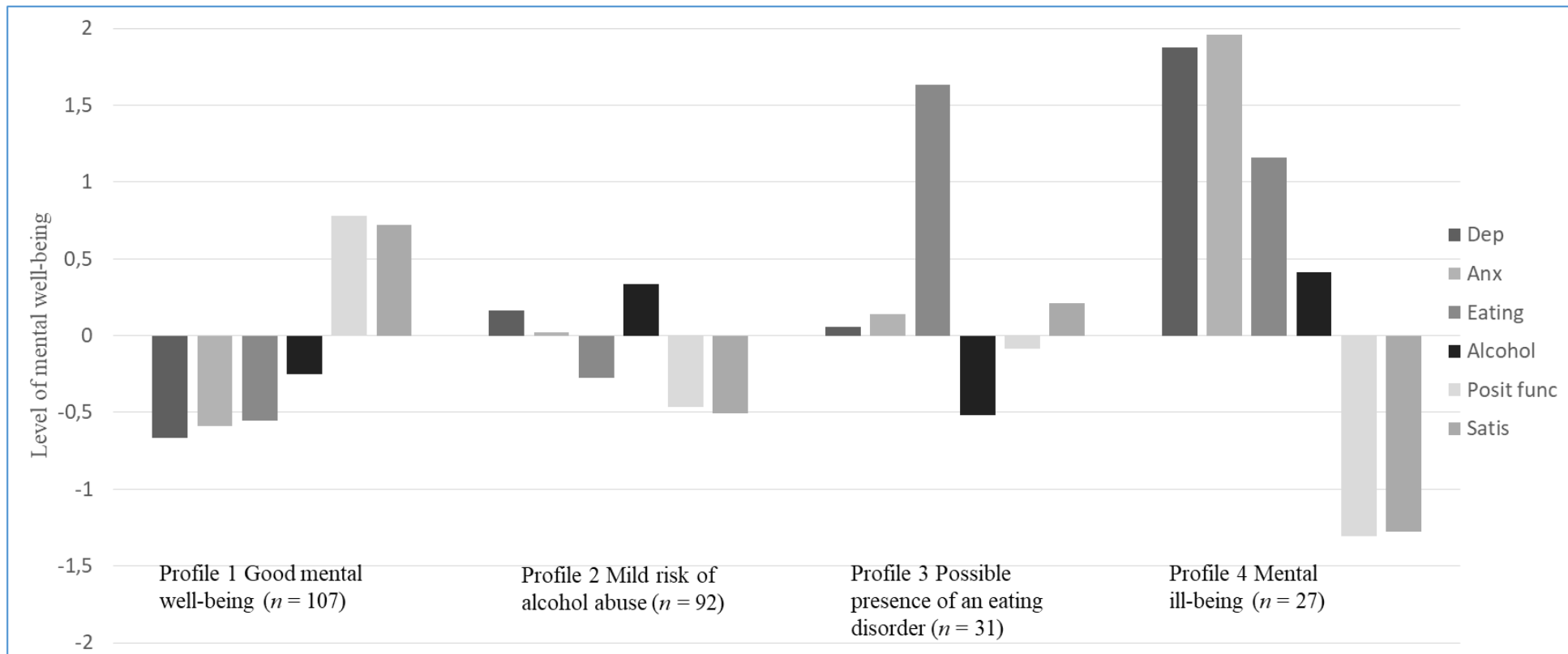
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PROFILES OF MENTAL WELL- AND ILL-BEING

Figure 1

Profiles of Mental Well- and Ill-being among Finnish Elite Athletes



Note. Dep = Depression symptoms, Anx = Anxiety symptoms, Eating = Possible presence of an eating disorder, Alcohol = Risk for alcohol abuse, Posit func = Positive functioning, Satis = Life satisfaction

Table 1

Means, Standard Deviations, Reliabilities (on the Diagonal) and Person Correlations of the Study Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1 Depression	6.58	6.52	.88										
2 Anxiety	7.29	7.86	.71**	.89									
3 Possible prevalence of an eating disorder	0.61	0.93	.50**	.41**	.52								
4 Risk of alcohol abuse	4.66	3.52	.17*	.18**	-.05	.68							
5 Life satisfaction	5.03	0.57	-.66**	-.46**	-.33**	-.18**	.72						
6 Positive functioning	3.20	0.37	-.68**	-.47**	-.38**	-.18**	.65**	.74					
7 Sport success-related pressures	3.73	0.92	.35**	.26**	.28**	.13*	-.26**	-.33**	.79				
8 Overcommitment to sport	3.06	0.92	.25**	.23**	.31**	-.00	-.18**	-.33**	.39**	.76			
9 Sport-related worries	3.01	1.00	.37**	.28**	.28**	.09	-.35**	-.43**	.38**	.20**	.63		
10 Personal development	4.55	0.49	-.09	-.05	.04	-.10	.14*	.17**	.22**	.32**	.05	.67	
11 Satisfaction with coaching	4.00	0.72	-.23**	-.17**	-.15*	-.10	.24**	.30**	-.12	-.01	-.19**	.28**	.67

** $p < .01$, * $p < .05$

PROFILES OF MENTAL WELL- AND ILL-BEING

Table 2

Differences in Background Factors between Identified Four Profiles of Mental Well- and Ill-Being

Variable	(1) Good mental well- being (<i>n</i> = 107)	(2) Mild risk of alcohol abuse (<i>n</i> = 92)	(3) Possible presence of an eating disorder (<i>n</i> = 31)	(4) Mental ill-being (<i>n</i> = 27)	χ^2 (df)
% of women	56.1 ^b	58.7	96.8 ^a	81.5	20.29 (3)***
% of active athletes	55.1 ^b	73.9 ^a	74.2	68.9	9.17 (3)*
Age (years)					36.32 (15)**
< 19	9.3	12.0	32.3 ^a	10.3	
19–24	20.6 ^b	34.8	35.5	55.2 ^a	
25–34	9.6	23.9	19.4	17.2	
35–44	15.9	14.1	3.2 ^b	17.2	
45–54	14.0 ^a	7.6	9.7	-	
> 55	10.3	6.5	-	-	

Note. ^a Typical (adjusted residual > 1.96), ^b Atypical (adjusted residual < -1.96).

PROFILES OF MENTAL WELL- AND ILL-BEING

Table 3

Differences in Sport-Related Demands and Resources between Identified Four Profiles of Mental Well- and Ill-Being

Variable	(1) Good		(2) Mild		(3) Possible		(4) Mental		Pairwise		
	mental		risk of		presence of		ill-being		comparisons ²		
	well-being		alcohol		an eating		(n = 27)				
	(n = 107)		abuse		disorder						
			(n = 92)		(n = 31)						
Demands	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> ¹ (<i>df</i>)	<i>p</i>	<i>p</i> < .05
Sport success-related pressures	3.34	0.98	3.89	0.78	4.13	0.79	4.28	0.63	15.11 (3, 86.76)	< .001	1 < 2, 3, 4; 2 < 4
Overcommitment to sport	2.71	0.85	3.10	0.89	3.74	0.77	3.48	0.82	16.57 (3, 82.93)	< .001	1 < 2, 3, 4; 2 < 3
Sport-related worries	2.55	0.89	3.22	0.93	3.09	0.89	3.92	0.84	21.98 (3, 81.94)	< .001	1 < 2, 3, 4; 2, 3 < 4
Resources											
Personal development	4.58	0.47	4.49	0.56	4.74	0.39	4.47	0.39	3.20 (3, 87.04)	< .05	

Satisfaction with coaching	4.26	0.64	3.80	0.76	3.96	0.62	3.71	0.67	9.74 (3, 81.98)	< .001	1 > 2, 3, 4
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*Note.*¹ Welch's *F*-test, ² Games-Howell post hoc-test