

An Online Guided ACT Intervention for Enhancing the Psychological Well-being of Female Soccer Players in Pre-season

Jaakko Nikander¹, Johanna Saarni² Johanna K. Ihalainen² and Maarit Valtonen³

¹Department of Psychology, University of Jyväskylä, ²Faculty of Sport and Health Sciences, University of Jyväskylä, ³Research Institute for Olympic Sports.

Corresponding author: Jaakko Nikander
E-mail: jaakosni@jyu.fi

Abstract

This study investigated whether an internet-based intervention aimed at enhancing the psychological well-being of female soccer players before the competitive season could be an effective approach to support the players to face the demands on and off the field. Players ($n = 43$; 17-26 years old) on the four separated teams in Finland's highest league were assigned to either a guided six-week online Acceptance and Commitment Therapy Intervention (ACTi) or to a control condition (CON). A between-groups pre-post (ACTi vs. CON) design was implemented before the competitive season. Players in the ACTi were offered three group sessions, performed internet-based tasks, and were individually supported by a guide. The results demonstrated that the ACTi players maintained their sports-related well-being (between-group, $d = 0.72$), while the sports-related well-being of the CON players, especially emotional and social well-being, had declined. In addition, ACTi players' perceived stress ($d = 0.60$) and depressive symptoms ($d = 0.88$) declined, while their psychological flexibility in sports ($d = 0.41$) increased compared to the CON players. These results suggest that before the competitive season, players' sports-related well-being decreases. The ACT intervention seemed to prevent this decrease and provide players with the skills to cope with emotional and social stressors related to the competitive season.

Keywords: Acceptance and commitment therapy, Female players, Stress, Depressive symptoms, Psychological well-being

In recent years, women's soccer has developed from the amateur to the professional level as a result of governing strategies (Kryger et al., 2021). Globally, there are still only 1,396 professional female players (UEFA, 2016), meaning that the majority of players need to balance sports with other domains (e.g., academics and jobs). As such, many players confront unique cultural, financial, and interpersonal challenges that may overwhelm abilities, resources, and coping strategies, causing struggles to manage their competing demands and expectations, thereby diminishing their life satisfaction and increasing the prevalence of mental health issues. For example, Prinz, Dvořák, and Junge (2016) evaluated German first league female players, finding that at least once during their careers, a third of players reported major depressive symptoms and a fourth of players reported mild to moderate depressive symptoms. Furthermore, Küttel, Durand-Bush, and Larsen (2021) found that youth Danish female players perceived their well-being lower and demonstrated four times higher probability of expressing anxiety and depressive symptoms compared to males. Overall, there is increased concern for high-performance

athletes' mental health. Recently, a consensus statement (Henriksen et al., 2020) provided recommendations on how to support elite athletes' mental health. Subsequently, Küttel and Larsen (2020) examined athletes' mental health and well-being and suggested that both should be examined from the perspective of promotion and protective factors, rather than focusing on the presence or absence of mental illness.

Protection and Promotion of Mental Health

The start of the competitive season is a challenge players confront that may trigger anxiety, distress, and uncertainty on both the individual and interpersonal levels. Prinz et al. (2016) recognized that sport-specific stressors, such as performance pressure, are a risk factor for the psychological well-being of the players. Further, Tamminen et al. (2016) found that in the lead-up to a match, there is a significant decline in affectivity and emotional regulation among team sports athletes, which may lead to a lower sense of enjoyment. They found that these relationships were moderated by athletes' perceptions of social support and predicted teams' likelihood of success in the game.

Despite risk factors, several mental health protective factors have been recognized among elite athletes (Küttel & Larsen, 2020; Pankow, McHugh, Mosewich, & Holt 2020; Prinz et al., 2016), for example, positive interpersonal relationships, protective behaviors (e.g., self-reflection, emotional regulation), future planning, managing commitments, a positive outlook, and focusing on shifting roles when necessary. Thus, resources and skills to deal with commitments and achieve balance in life are crucial for the global well-being of the athletes (Lundqvist & Sandin, 2014). Indeed, female players responding in an active manner to sports-related challenges report higher psychological well-being compared to players who do not respond actively (Ferguson, Kowalski, Mack, & Sabiston 2014; 2015). Further, Ferguson et al. (2014) suggested that optimism and a positive mindset may prevent declines in global psychological well-being when athletes face sports-related challenges.

Acceptance and Commitment Therapy

Previous studies (e.g., Küttel & Larsen, 2020; Prinz et al., 2016) have shown that there is a need for interventions to promote mental health among athletes. For example, Prinz et al. (2016) found that almost 40% of elite female soccer players reported a need for professional psychological support while they still played. It has been suggested that cognitive, behavioral, and mindfulness-based interventions, for example, acceptance and commitment therapy (ACT), are found promising and effective in decreasing psychological distress in the general population (Räsänen, Lappalainen, Muotka, Tolvanen, & Lappalainen, 2016). ACT approaches include themes such as elucidating values, committed action, staying in the present moment, acceptance, cognitive defusion, and self as context (Hayes, Strosahl, & Wilson, 2012). According to Hayes, Luoma, Bond, Masuda, and Lillis (2006) acceptance refers to accepting thoughts, feelings, and memories in a non-judgmental way as they are. Values denotes to recognizing values that are considered important for an individual, and which work as guidelines for behavior. Committed action means that individuals take value-based action and concrete steps towards them. Self-as-context refers to taking an observer's perspective towards own thoughts and feelings. Staying in the present moment signifies that individuals contact with the present moment and respond in a flexible manner to the external and internal incidents. Cognitive defusion means that individuals see their own uncomfortable thoughts without getting caught up in them. By emphasizing acceptance, mindfulness, and value-based processes, ACT, as a transdiagnostic approach (i.e., apply the same underlying treatment principles across mental disorders), aims to enhance psychological flexibility (Arch et al., 2012), which may also contribute to the promotion of well-being.

In sport, multiple studies have found benefits of mindfulness and acceptance interventions for athletes' performance (Bühlmayer, Birrer, Röthlin, Faude, & Donath, 2017; Lundgren et al., 2020; Noetel, Ciarrochi, Van Zanden, & Lonsdale, 2017). Furthermore, Birrer, Röthlin and Gareh's (2021) mini-review suggested that acceptance-based interventions can enhance athletes' well-being in sport. Moreover, Henriksen, Haberl, Baltzell, Hansen, Birrer, and Larsen (2019, p. 10) stated that the ACT approach "help athletes to make good decisions, be in the present moment, focus on a task, be willing to experience the full range of emotions as natural and take steps towards their values and game plan". The previous literature has mostly focused on enhancing performance via mindful and acceptance approaches, however, as supporting mental health is a core component of any

culture of excellence (Henriksen et al., 2020), it would be important to examine whether and how the ACT approach also enhances athletes' psychological well-being in and outside of sport.

In recent years, internet-based and especially self-help interventions have become popular due to their availability and cost-effectiveness, on the one hand, and their promising outcomes in enhancing an individuals' well-being and mental health, on the other (e.g., Andersson & Cuijpers, 2009; Grist & Cavanagh, 2013). Superior results have been achieved through guided self-help interventions compared to self-help alone (Johansson & Andersson, 2012; Richards & Richardson, 2012). In a previous study, a guided online ACT intervention with university students indicated that ACT participants experienced greater improvements in well-being, life satisfaction, and mindfulness skills, and these effects were maintained over time (Räsänen et al., 2016). Comparing the themes of ACT to the protective factors recognized earlier among athletes, the similarity is clear. Thus, an ACT as an online intervention modified for sports could be a promising approach to enhance and promote the mental health of female soccer players in the pre-season.

The aim of the present study was to investigate whether a guided online ACT intervention would maintain or enhance players' psychological well-being compared to players who did not receive the intervention. The present study tested the hypothesis that players participating in an internet-based ACT intervention would: a) improve or maintain their sports-related psychological well-being in pre-season, b) diminish their possible psychological stress and depressive symptoms, and c) demonstrate higher psychological flexibility in sports and mindfulness skills.

Method

The study was approved by the ethics board of the relevant university before data collection commenced. Participants signed an informed consent form before participating in the study. The data were collected using an online questionnaire.

Design of the Present Study

The study was designed as a controlled trial with four parallel groups. Players from separate teams acted as control and intervention groups, that is, randomization was done at team level: teams were randomly assigned to either intervention or control condition (i.e., two teams in the intervention and two teams in the control condition). This was done, since some of the intervention exercises were supposed to be implemented in the teams' daily practices. Participants in the experimental group received access to an internet-based ACT intervention (ACTi) based on Lappalainen et al., (2014, 2015). The study design is in line with Räsänen et al. (2016) as it follows the same structure of the intervention (See Räsänen et al., 2016). Both groups were assessed preintervention in pre-season and one day before the first game after the intervention (postintervention, six weeks after pre-measurement). Six weeks' intervention period is supported by the previous studies (e.g., Räsänen et al., 2016; Kaufman, Glass, & Arnkoff, 2009). Figure 1 illustrates the participant flow.

Inclusion and Exclusion Criteria

Participation was limited to players who (a) competed in the highest national league, (b) were age 15 years or above, (c) had internet access, and (d) were willing to commit to the intervention. The exclusion criteria included: (a) not having completed the preassessment on

time, (b) not participating in the group sessions, (c) not completing the intervention (at least 60 % of the modules), and (d) not completing the post-intervention assessment on time.

Recruitment

Players were recruited by emails sent to the Finnish national league coaches and via an information meeting for players. Both the emails and the meeting included a brief description of the intervention and general information, such as the ACT interventions web link, email, and contact person. Of the 77 players recruited, 43 volunteered to participate. Participants' mean age in the ACTi group was 21.7 (SD = 4.25) and in the CON group was 22.1 (SD = 4.0).

Internet-based ACT intervention

The intervention comprised three group sessions (5–6 players per session) with a guide (a person who support the progress of the players during the intervention) and a six-week internet-based intervention (called MindfulAthlete), which included six modules. Each module had four themes. The modules were created according to ACT process principles, including self-knowledge, clarifying values, being present, awareness and acceptance, psychological flexibility, and self-management. Modules introduced skills and strategies for practical training based on these principles. Players were given a predetermined path/order to follow to accomplish the material, and they were instructed to complete one module in a week. However, the intervention program was designed in such a way that the players could focus on the material according to their individual interests and needs, including an option to work on previous modules. The intervention program comprised texts and videos with self-help-related texts and videos, well-being assignments, experiential exercises, and relevant metaphors. In the personal platform online, players submitted their responses to each weeks' assignments in the form of a commentary. Table 1 presents a description of the intervention.

Similar to Räsänen et al. (2016), we provided guidance in the form of group session during designed to prevent attrition during the intervention (Christensen, Griffiths, & Farrer, 2009). Group session were arranged in a way that only players from the same team were in the same session. A PhD student (guide) from the Department of Psychology led the group sessions. The guide had extensive experience as an athletic trainer and a mental trainer, which ensured a greater understating of the demands of sports at the highest level and the ability to provide sports-specific metaphors, exercises, and examples. The Guide's role is further described in Table 1.

The group sessions served to facilitate the learning process, practice skills, and the application of the intervention material to their daily lives, including sport practices. In addition, the group sessions facilitated the reporting of experiences and outcomes to the guide and the group. During group sessions, peer learning was emphasized, and the players shared their experiences. The players' initiative of how to implement the skills and practices for the upcoming weeks' training was supported such that the process would be ongoing in their training environment. Group sessions also served as an educational foundation; that is, the topics used in group sessions included, for example, a theme of injury rehabilitation.

Measurements

Demographic information was collected at the preintervention, including age and education. Primary outcome measures included sports-related psychological

well-being and perceived stress. Secondary outcome measures included depressive symptoms, anxiety, stress scale scores, and self-esteem. Process measures included psychological flexibility and a mindfulness questionnaire. A reliability analysis was conducted at preassessment to evaluate internal consistency off all measures.

Sports-related psychological well-being

Sports-related psychological well-being was measured using the *Sport Mental Health Continuum Short Form* (Sport MHC-SF). The measure is a 14-item self-reporting questionnaire that measures psychological, emotional, and social well-being (Foster & Chow, 2019). Participants were asked to rate how often during the past month they had experienced feelings of well-being in sports. Each item was ranked on a 6-point Likert scale (0 = *never* through 5 = *every day*). In previous studies, the test scores of the Sport MHC-SF have shown good validity (Foster & Chow, 2019). Cronbach's alpha for the Sport MHC-SF was 0.73. For the subscales, alphas were emotional well-being, 0.83, social well-being 0.59, and psychological well-being 0.58.

Perceived stress

Perceived stress was assessed using the *Perceived Stress Scale-10* (PSS-10; Cohen, Kamarck, & Mermelstein, 1983). PSS-10 is a 10-item scale measuring symptoms of stress. Participants were asked to rate how stressful they perceived their lives to have been within the past month. Each item was ranked on a 5-point Likert scale (0 = *never* through 4 = *very often*). The internal consistency in a Finnish sample was 0.72 (Räsänen et al., 2016). In the current study, Cronbach's alpha was 0.86.

Depressive symptoms, anxiety and stress

Depressive symptoms, anxiety and stress were assessed using the *Depression Anxiety Stress Scale* (DASS-21; Lovibond & Lovibond, 1995). DASS-21 is a 21-item scale. Each item was ranked on a 4-point scale (0 = *did not apply to me* through 3 = *applied to me very much*). In previous studies, the test scores have demonstrated high validity (Henry & Crawford, 2005). Cronbach's alphas in the current sample were depression 0.86, anxiety 0.69, and stress 0.79.

Self-esteem

Self-esteem was measured using five items from the Rosenberg (1989) *Self-Esteem Scale*. Each item was ranked on a 5-point Likert scale (1 = *strongly disagree* through 5 = *strongly agree*). In previous studies involving athletes in Finland, the test scores have demonstrated good internal consistency (Nikander et al., 2021). Cronbach's alpha in the current sample was 0.83.

Psychological flexibility

Psychological flexibility was measured using the *Psychological Flexibility in Sport Scale* (PFSS; Johles et al. 2020). PFSS consists of seven questions and measures the extent to which participants avoid distressing thoughts, emotions, behaviors, or memories. All items were ranked on a 7-point Likert scale (1 = *never true* through 7 = *always true*). Lower scores reflected higher levels of psychological flexibility. In previous studies involving athletes, the test scores have demonstrated good internal consistency (0.87, Johles et al., 2020). In this study, Cronbach's alpha was 0.87.

Mindfulness

Mindfulness was assessed using the *Five Facet Mindfulness Questionnaire* (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). FFMQ contains a total of 39 statements and has five subscales—observing, describing, non-judging, non-reactivity, and acting with awareness. Each item was ranked on a 5-point Likert scale (1 = *rarely true* through 5 = *very often true*). Higher scores reflect

higher mindfulness skills. In this study, Cronbach's alphas for different subscales varied between 0.70 and 0.90.

Analysis strategy

To perform the analyses, we used T-test and chi-square test with SPSS (version 26) software and latent change score modelling with the Mplus (version 8.4; Muthen & Muthen, 1999-2017) statistical program with the full information maximum likelihood (MLR) estimator and includes all data. Latent change score modelling is a technique in a structural equation modelling (SEM) and it was used to examine changes over time. T-test and chi-square were used to examine the baseline differences between the ACTi and CON groups. To test the effect of the intervention condition from preintervention assessment to postintervention assessment, we tested latent change scores and group \times time interaction. Analysis was performed separately to each scale. Missing values were supposed to be missing at random (MAR). Wald's test was used as an overall test to assess whether groups change differently from pre- to post assessment.

Cohen's d with correction factor for small samples was used to report the effect sizes (ES). To calculate the between-group ES for both pre-measurement and post-measurement, we divided the mean difference between ACTi and CON groups by the pooled standard deviation (S_{pooled}) of two conditions. This considers the differences between the ACTi and CON groups at preintervention assessment. At postintervention assessment corrected Cohens d value was calculated. To calculate within-group ES for pre-measurement and post-measurement, we divided the mean change from pre-measurement by the S_{pooled} (Morris & DeShon, 2002). According to Cohen (1998), between-group ES of 0.20 was considered small, 0.50 moderate, and over 0.80 large, whereas within-group ES of 0.50 is considered small, 0.80 moderate, and over 1.10 large.

Results

Adherence

The post-assessment was completed by 20 (80 %) participants in the ACTi group and 13 in the control group. Adherence to the intervention was assessed by calculating the percentage of completed modules (exercises) for the ACTi group, among whom four (16%) participants did not complete the intervention, and three (12%) discontinued after three modules. Finally, 12 participants completed the whole intervention, and 14 completed at least four modules (60%).

Intervention effects: ACTi vs CON

There were no statistically significant differences between the ACTi and CON groups at a baseline in terms of demographic characteristics and outcome measurements, except FFMQ. Table 2 presents the means, standard deviations, and whether statistically significant changes occurred from pre-to-post-intervention assessment between groups.

Investigation on whether groups changed differently from pre-to post (see also Table 2), ACTi was superior to CON. Group \times time interaction was significant on sports-related mental health, emotional well-being, social well-being, depressive symptoms, psychological flexibility, and perceived stress. ACTi demonstrated a drop in perceived stress, maintained sports-related well-being, and showed a small increase in emotional and social well-being, while CON showed a drop in sports-related mental health, emotional and social well-being, and perceived stress.

Additionally, decrease in depressive symptoms and increase in psychological flexibility were observed in ACTi, while CON showed increase in depressive symptoms and a drop in psychological flexibility.

The between-group and within-group ESs from pre- to postintervention assessments are presented in Table 3. The results of the between-group ES showed moderate to large differences between ACTi and CON in sports-related mental health, depressive symptoms, and perceived stress. The ES for psychological flexibility was small. Small within-group ESs were observed for depressive symptoms in ACTi. The Control group's within ESs were small for sports-related mental health, emotional, and social well-being.

Discussion

Using a controlled trial design, the present study compared a control group with a group following a guided internet-based ACT intervention for facilitating and maintaining the psychological well-being of female soccer players before the competitive season, in terms of their sports-related psychological well-being and perceived stress. Players following the ACTi maintained sports-related mental health and reduced depressive symptoms, while the control group showed decreased sport-related psychological well-being, especially emotional and social well-being. It seems that before the competitive season, players' sports-related well-being declines, especially in the subscales of emotional and social well-being. Furthermore, the ACT intervention seems to prevent this decline, provide players with skills to cope with emotional and social stressors related to the competitive season, and support their psychological well-being. These results are in line with previous studies on online interventions (Lappalainen et al., 2014;2015; Räsänen et al., 2016; Birrer et al., 2021) and indicate that it is possible to create cost-effective, brief, and accessible online interventions for athletes.

The within-group ES of both groups from pre-to postintervention assessments was mainly small to moderate. A low mean level of constructs at baseline may allow for limited improvement. While participants demonstrated a normal level of depressive symptoms in the preintervention assessment, the level of depressive symptoms had dropped in post-measurement, in line with previous studies showing that ACT is effective in decreasing symptoms of depression (Räsänen et al., 2016). This finding is promising, since depression is one of the most common mental health challenges and barrier to female soccer players' well-being (Prinz et al., 2016; Küttel et al., 2021). Overall, it seems that the start of the competitive season did not affect general well-being, as no significant within-group changes were observed in CON in other variables than sports-related well-being. Although general mental health protects against sports-related issues (Ferguson et al., 2015), sports-related challenges can cross over to other domains in athletes confronting overlapping demands (Sorkkila, Ryba, Selänne, & Aunola, 2020) or injuries (Trainor, Crocker, Bundon, & Ferguson, 2020). Therefore, it is important to promote sports-related mental health. Special attention is needed for youth players, as Küttel et al., (2021) showed that scores of anxiety, stress, and depressive symptoms increased when progressing in age, highlighting the transition from junior to senior, but also demands from other life domains.

The findings of our study suggest that the opening of the competitive season affects players' psychological well-being, namely their emotional and social well-being. This is in line with previous studies (Tamminen et al., 2016) showing that there is an interaction between players'

emotional regulation and the interpersonal emotional climate. Players may be insecure about their performance, thus increasing performance pressure in the first games after a long off-season (Prinz et al., 2016). Tamminen et al. (2016) observed a decline in emotional regulation and affectivity in the lead-up to a match, which may result in decreased well-being (i.e., enjoyment) in sports. It is possible that the opening of the season may affect teams' social climate and support towards each other, causing a drop in emotional well-being.

The results are in line with the previous studies of acceptance interventions in sport showing positive impact (Noetel et al., 2017; Birrer et al., 2021). However, although, acceptance and mindfulness are closely related (Henriksen et al., 2019), we did not see any change in mindfulness measures. As mindfulness exercises seem to decrease psychological stress (Solberg, Ingjer, Holen, Sundgot-Borgen, & Holme, 2000) it could have been assumed that part of the decrease in perceived stress in ACTi would have been caused by the mindfulness exercises. This could be explained by the fact that the intervention empathized self-knowledge, self-compassion and value-based actions, and included only one module of mindfulness, which was also situated in the end of the intervention. For example, Zhang, Si, Duan, Lyu, Keatly and Chan (2016) proposed that mindfulness practices are dependent on engagement and continued practice. Therefore, as Birrer et al., (2021) suggested that well-being in and outside sport, as well as management of stress, could be mediated by other psychological processes, for example, enhanced emotion regulation and psychological flexibility. In the light of the results of the present study, it seems that self-knowledge, self-compassion, and value-based actions may have an important role in the ACT interventions to enhance athletes' well-being and psychological flexibility.

The attrition rate in this study was relatively high, which is in line with previous studies showing high dropout rates in online interventions (Day et al., 2013; Melville et al., 2010). Although the players' expectations of the intervention were high, they reported competing demands and lack of time as barriers to their continuing participation. Reporting a low attrition rate, Räsänen et al. (2016) and Lappalainen et al. (2014) proposed that face-to-face individual support may significantly contribute to retaining participants. In our study, we offered group sessions instead of individual face-to-face coaching. Since the study was conducted during the global coronavirus pandemic, meetings were arranged via an online platform, which may

also have affected the attrition rate. In future studies, face-to-face individual meetings are recommended.

There are a number of limitations to be considered. Our study included a low sample size, and participants were from four different teams. The time to recruit players was limited, which may have caused the low sample size since the study was supposed to be conducted within six weeks before the first game. Another challenge caused by the global pandemic was that group-sessions were held online rather than in person. Nevertheless, this may also be a strength in that a completely online-based intervention can have positive outcomes. Future studies should cover all phases of the training and competitive seasons and include longitudinal follow-up. In the current study, Cronbach's alpha for the scale of emotional and social well-being was relatively low, which may be due to the number of items (three for emotional well-being and five for social well-being) used to measure sports-related well-being (see Wells & Wollack, 2003). Furthermore, in Räsänen et al.'s (2016) study, feedback for individual assignments was provided immediately (within 48 h), while in our study it was provided within four days.

The online intervention conducted in our study provides an example of an effective support for athletes to promote and protect their mental health and well-being. For future studies, identifying and testing different ways of providing internet-based interventions would be valuable, for example, the degree of guidance, the length of the intervention, and the elements of the intervention that have greater effects. As previous studies have shown, an internet-based intervention can be utilized as a self-help intervention or combined with other forms of psychological well-being services. Practical recommendations for experts to implement ACT could include integrating value based tasks, self-knowledge and self-compassion exercises, and motivating players to commit to the internet-based intervention and encouraging participant to use the skills in their daily practices and lives. Team coaches should also be encouraged to be involved in the process as they can integrate psychological themes according to the ACT principles to the daily practices. Finally, as it seems that the beginning of the season affects players' well-being, their well-being should be considered well before the game season starts. Players may benefit from being provided with exercises related to ACT.

Declaration of Conflicts of Interest

The author(s) declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Figure 1 : The participant flow

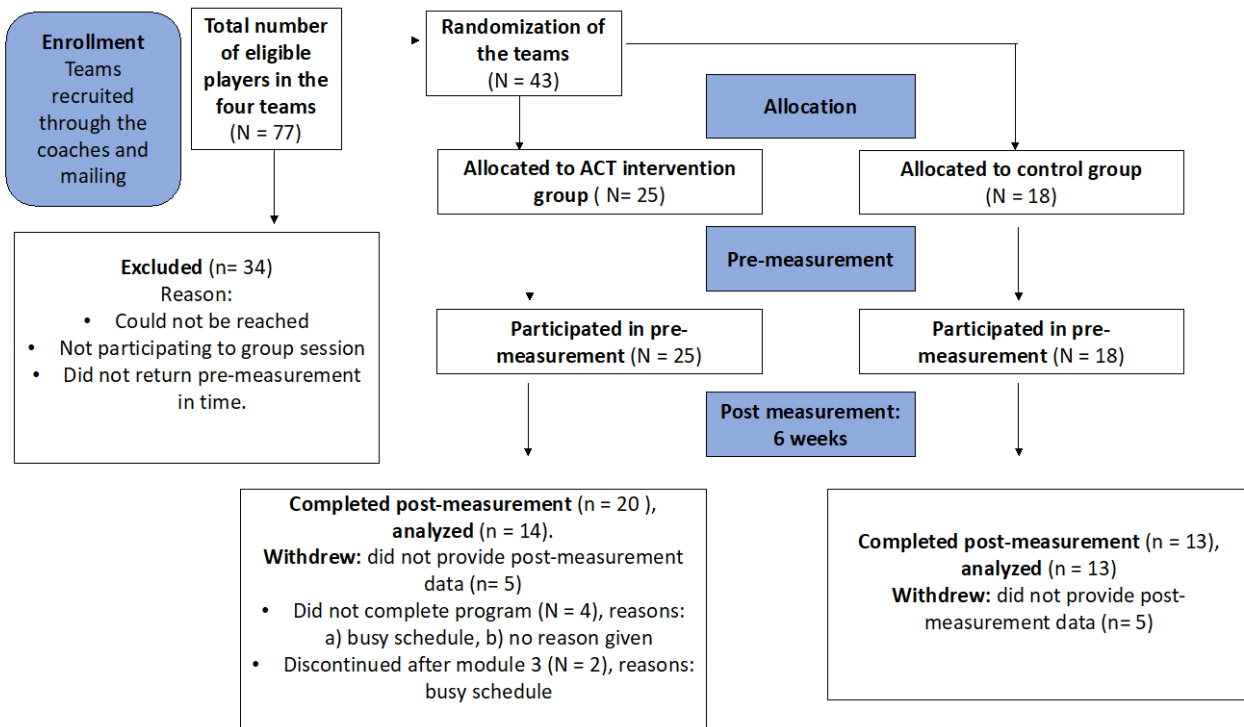


Table 1: Description of the ACT intervention: modules, themes, and guide's role (modules)

Core modules and group sessions/per week	Theme and aim	Examples of exercises and activities
1. Virtual Introductory meeting	Baseline measurements. Brief orientation about the intervention. Guide's role: Lead group sessions/ focus group interviews, map participants' current situation and problems.	Focus group interview targeting players' expectations, current situations and problems.
Online session: Self-knowledge and well-being	Clarifying own situation. Difference between self-knowledge and self-confidence. Rule-based thinking and acting. Guide's role: Provide written feedback to players on their assignments.	<i>Current time-planning</i> (exercise) <i>Scale of well-being</i> (exercise) <i>Behavioral analysis</i> (exercise) <i>Energizing factors in life</i> (exercise)
2. Online session: Motivation and values	Clarifying values. Difference between values and goals. Guide's role: Provide written feedback to players on their assignments.	<i>Recognizing internal and external motivation</i> (exercise) Value analysis (exercise) <i>Goal setting</i> (exercise)
Group session	Reflect and discuss themes in the previous modules. Sport-specific focus on motivation. Guide's role: Encourage players on their progress and process, provide recommendations and personalized exercises, guide them in the next modules' topics.	<i>The best memory in sports</i> (exercise) What kind of athlete are you now? What kind of athlete you want to be?
3. Online session: Being present, aware, and focused on performance	Contact with the present moment. Learning how to be mindful in the moment. Developing and focusing on the awareness of the self-as-context. Guide's role: Encourage players to integrate skills into practices.	Mindfulness practices <i>Time-window</i> (exercise) Own "circles" (thought, emotion, action)
4. Online session: Acceptance, managing thoughts and emotions.	Acceptance of thoughts, feelings, and memories as they are. Change what can be changed through action. Guide's role: Support the actions players have introduced and taken in their daily lives.	Thought and emotion regulation exercises <i>You are not the same as your thoughts</i> (exercise) <i>Warm cinnamon buns</i> (exercise)
Group session	Reflect and discuss the themes in the previous modules. Sport-specific focus on injuries and confronting challenges. Guide's role: Focus on the players' patterns of thinking and their functionality.	How to overcome and learn from set-backs.
5. Online session: Self-compassion, psychological flexibility	Self-compassion as a resource. Empathy toward oneself. Reflection on the process. Guide's role: Encourage players to integrate new skills into daily life.	Self-compassion exercises: <i>What would you say to your friend.</i> Miracle exercise: <i>You wake up in one morning... What do you notice.</i>
6. Online session: Self-management and strengthening new skills	Self-perception and focus on taking concrete action. Reflecting on the program and how to continue practicing and implementing skills. Guide's role: Provide written feedback to the players on their process.	<i>How would you describe yourself as a person, as an athlete?</i> (exercise) <i>Diamond model</i> (exercise)
Group session and concluding session	Concluding the intervention. Post-measurement. Guide's role: Collect feedback on the intervention	

Table 2: Mean scores (M), standard deviation (SD) of all measures at pre- and post-measurement between ACTi and CON

Scale	Group	Pre M (SD)	Post M (SD)	Wald test ^a , df = 1, (p-value)
Sport MHC-SF	ACTi	3.75 (.49)	3.77 (.62)	9.91
	CON	3.87 (.44)	3.48 (.58)	(< .001)
Emotional well-being ^b	ACTi	3.62 (.69)	3.76 (.85)	18.71
	CON	3.92 (.59)	3.31 (.94)	(< .001)
Social well-being ^b	ACTi	4.20 (.41)	4.25 (.43)	8.31
	CON	4.33 (.37)	3.99 (.38)	(.004)
Psychological well-being ^b	ACTi	3.64 (.56)	3.55 (.71)	1.70
	CON	3.64 (.45)	3.50 (.51)	(.192)
PFSS	ACTi	23.00 (8.04)	21.71 (7.79)	10.87
	CON	22.54 (6.96)	23.38 (6.13)	(.001)
DASS Depression	ACTi	5.50 (3.18)	3.64 (2.59)	11.11
	CON	4.69 (4.29)	5.77 (4.16)	(<.001)
DASS anxiety	ACTi	4.50 (3.11)	3.71 (2.19)	0.64
	CON	3.38 (2.81)	3.77 (3.03)	(.426)
DASS stress	ACTi	6.07 (3.17)	5.86 (3.04)	0.01
	CON	6.69 (3.35)	6.23 (4.16)	(.929)
PSS-10	ACTi	16.50 (5.21)	15.57 (4.48)	7.52
	CON	16.46 (6.21)	18.69 (6.30)	(.006)
Self-esteem	ACTi	3.41 (.63)	3.34 (.65)	0.17
	CON	3.44 (.59)	3.43 (.69)	(.679)
FFMQ	ACTi	118.78 (19.49)	118.07 (16.6)	3.96
	CON	126.92 (11.39)	130.15 (11.43)	(.060)

^a Investigates whether groups change differently from pre to post. ^b Subscale of the MHC-SF. MHC-SF = Sport Mental Health Continuum Short Form, PFSS = Psychological Flexibility in Sport Scale, PSS-10 = Perceived Stress Scale, FFMQ = Five Facet Mindfulness Questionnaire, DASS = Depression, Anxiety, Stress Scale.

Table 3: The between-group and within-group effect sizes of all measures from pre-to post-measurement

Measure	Between pre-post	Within ACTi pre-post	Within control pre-post
MHC-SF	.72***	.03	.65**
Emotional well-being ^b	.88***	.16	.67**
Social well-being ^b	.99***	.13	.62**
Psychological well-being ^b	.08	.06	.08
PFSS	.41*	.16	.12
DASS Depression	.88***	.56**	.22
DASS anxiety	.46	.25	.11
DASS stress	.09	.06	.11
PSS-10	.60***	.17	.31
Self-esteem	.09	.10	.01
FFMQ	.29	.03	.24

Note. * = $p < .05$, ** = $p < .01$, *** = $p < .001$. ^b = subscale of the MHC-SF. MHC-SF = Sport Mental Health Continuum Short Form, PFSS = Psychological Flexibility in Sport Scale, PSS-10 = Perceived Stress Scale, FFMQ = Five Facet Mindfulness Questionnaire, DASS = Depression, Anxiety, Stress Scale.

References

- Andersson, G., & Cuijpers, P. (2009). Internet-based and other computerized psychological treatments for adult depression: a Meta-Analysis. *Cognitive Behaviour Therapy*, 38(4), 196–205. <https://doi.org/10.1080/16506070903318960>
- Arch, J. J., Eifert, G. H., Davies, C., Plumb Vilardaga, J. C., Rose, R. D., & Craske, M. G. (2012). Randomized clinical trial of cognitive behavioural therapy (CBT) versus acceptance and commitment therapy (ACT) for mixed anxiety disorders. *Journal of Consulting and Clinical Psychology*, 80(5), 750–765. <https://doi.org/10.1037/a0028310>
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27–45. <https://doi.org/10.1177/1073191105283504>
- Birrer, D., Röthlin, P., & Morgan, G. (2021). Helping athletes flourish using mindfulness and acceptance approaches – An introduction and mini review. *Sport and Exercise Medicien Switzerland*. <https://doi.org/10.34045/SEMS/2021/18>
- Bühlmayer, L., Birrer, D., Röthlin, P., Faude, O., & Donath, L. (2017). Effects of mindfulness practice on performance-relevant parameters and performance outcomes in sport: A meta-analytical review. *Sports Medicine*, 47(11), 2309–231. <https://doi.org/10.1007/s40279-017-0752-9>
- Christensen, H., Griffiths, K. M., & Farrer, L. (2009). Adherence in internet interventions for anxiety and depression: systematic review. *Journal of Medical Internet Research*, 11(2), e13. <https://doi.org/10.2196/jmir.1194>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, New Jersey: Lawrence Earlbaum Associates.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24(4), 385–396.
- Day, V., McGrath, P. J., & Wojtowicz, M. (2013). Internet-based guided self-help for university students with anxiety, depression and stress: a randomized controlled clinical trial. *Behaviour Research & Therapy*, 51(7), 344–351. <https://doi.org/10.1016/j.brat.2013.03.003>
- Ferguson, L. J., Kowalski, K. C., Mack, D. E., & Sabiston, C. M. (2014). Exploring self-compassion and eudemonic well-being in young women athletes. *Journal of Sport & Exercise Psychology*, 36(2), 203–216. <https://doi.org/10.1123/jsep.2013-0096>
- Ferguson, L. J., Kowalski, K. C., Mack, D. E., & Sabiston, C. M. (2015). Self-compassion and eudemonic well-being during emotionally difficult times in sport. *Journal of Happiness Studies*, 16(5), 1263–1280. <https://doi.org/10.1007/s10902-014-9558-8>
- Federation Internationale de Football Association (FIFA). (2019). *Women's football member associations survey report*.
- Foster, B. J., & Chow, G. M. (2019). Development of the sport mental health continuum—short form (sport MHC-SF). *Journal of Clinical Sport Psychology*, 13(4), 593–608. <https://doi.org/10.1123/jcsp.2017-0057>
- Grist, R., & Cavanagh, K. (2013). Computerised cognitive behavioural therapy for common mental health disorders, what works, for whom under what circumstances? A systematic review and meta-analysis. *Journal of Contemporary Psychotherapy*, 43, 243–251. <https://doi.org/10.1007/s10879-013-9243-y>
- Hayes, S.C., Luoma, J.B., Bond, F.W., Masuda, A., & Lillis, J. (2006). Acceptance and Commitment Therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, 44, 1–25. <https://doi.org/10.1016/j.brat.2005.06.006>
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). *Acceptance and Commitment Therapy: The Process and Practice of Mindful Change*. New York: The Guilford Press.
- Henriksen, K., Schinke, R., Moesch, K., McCann, S., Parham, W. D., Larsen, C. H., et al. (2020). Consensus statement on improving the mental health of high performance athletes. *International Journal of Sport and Exercise Psychology*, 1–8. <https://doi.org/10.1080/1612197X.2019.1570473>
- Henriksen, K., Haberl, P., Baltzell, A., Hansen, J., Birrer, D., & Larsen, H. (2019). Mindfulness and acceptance approaches: Do they have a place in elite sport? In K. Henriksen, J., Hansen, & C. Hvid Larsen (Eds.), *Mindfulness and Acceptance in Sport: How to Help Athletes Perform and Thrive under Pressure* (pp. 1-16). London: Routledge.
- Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS21): construct validity and normative data in a large nonclinical sample. *British Journal of Clinical Psychology*, 44, 227–239. <https://doi.org/10.1348/014466505X29657>
- Johles, L., Gustafsson, H., Jansson-Fröjmark, M., Classon, C., Hasselqvist, J., & Lundgren, T. (2020). Psychological flexibility among competitive athletes: A psychometric investigation of a new scale. *Front Sports Act Living*. <https://doi.org/10.3389/fspor.2020.00110>
- Junge, A., & Feddermann-Demont, N. (2016). Prevalence of depression and anxiety in top-level male and female football players. *BMJ Open Sport & Exercise Medicine*, 2(1), e000087. <https://doi.org/10.1136/bmjsem-2015-000087>
- Johansson, R., & Andersson, G. (2012). Internet based psychological treatments for depression. *Expert Rev Neurother*, 12(7), 862–869. <https://doi.org/10.1586/ern.12.63>
- Kaufman, K.A., Glass, C.R., & Arnkoff, D.B. (2009). Evaluation of mindful sport performance enhancement (MSPE): A new approach to promote flow in athletes. *Journal of Clinical Sport Psychology*, 25(4), 334.
- Kryger K, Wang A, Mehta R, Impellizzeri, FM, Massey A, McCall A. (2021). Research on women's football: a scoping review. *Science and Medicine in Football*, 4,1–10. <https://doi.org/10.1080/247339838.2020.1868560>
- Küttel, A., & Larsen, C. H. (2020). Risk and protective factors for mental health in elite athletes: A scoping review. *International Review of Sport and Exercise Psychology*, 13(2), 1–35. <https://doi.org/10.1080/1750984X.2019.1689574>

- Küttel, A., Durand-Bush, N., & Larsen, C.H. (2021). Mental health profiles of Danish youth soccer players: The influence of gender and career development. *Journal of Clinical Psychology*, 1–18. <https://doi.org/10.1123/jcsp.2021-0035>
- Lappalainen, P., Granlund, A., Siltanen, S., Ahonen, S., Vitikainen, M., Tolvanen, A., et al. (2014). ACT Internet based vs face-to-face? A randomized controlled trial of two ways to deliver Acceptance and Commitment Therapy for depressive symptoms: an 18 month follow-up. *Behaviour Research and Therapy*, 61, 43–54. <https://doi.org/10.1016/j.brat.2014.07.006>
- Lappalainen, P., Langrial, S., Kukkonen, H., Tolvanen, A., & Lappalainen, R. (2015). Web-based Acceptance and Commitment Therapy for depressive symptoms with minimal support: a Randomized Controlled Trial. *Behaviour Modification*, 39(6), 805–834.
- Lovibond, S. H., & Lovibond, P. F. (1995). Manual for the depression anxiety stress scales (2nd ed.). Sydney, Australia: Psychology Foundation of Australia.
- Lundqvist, C., & Sandin, F. (2014). Well-being in elite sport: Dimensions of hedonic and eudemonic well-being among elite orienteers. *The Sport Psychologist*, 28(3), 245–254. <https://doi.org/10.1123/tsp.2013-0024>
- Lundgren, T., Reinebo, G., Fröjmark, M.J., Jäder, E., Näslund, M., Svartvadet, P., Samuelsson, U. & Parling, T. (2021). Acceptance and commitment training for ice hockey players: A randomized controlled trial. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2021.685260>
- Melville, K. M., Casey, L. M., & Kavanagh, D. J. (2010). Dropout from Internet-based treatment for psychological disorders. *British Journal of Clinical Psychology*, 49, 455–471. <https://doi.org/10.1348/014466509X472138>
- Morris, S. B., & DeShon, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent groups designs. *Psychological Methods*, 7(1), 105–125. <https://doi.org/10.1037/1082-989X.7.1.105>
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.
- Nikander, J.A.O., Aunola, K., Tolvanen, A., & Ryba, T.V. (2021). Associations between student-athletes' self-esteem and career adaptability across high school years. *Scandinavian Journal of Medicine and Science in Sports*, 32(1), 789–797. <https://doi.org/10.1111/sms.14114>
- Noetel, M., Ciarrochi, J., Van Zanden, B., & Lonsdale, C. (2017). Mindfulness and acceptance approaches to sporting performance enhancement: A systematic review. *International Review of Sport and Exercise Psychology*, 1–37. <https://doi.org/10.1080/1750984X.2017.1387803>
- Pankow, K., McHugh, T-L., F., Mosewich, A.D., & Holt, N.L. (2021). Mental health protective factors among flourishing Canadian women university student-athletes. *Psychology of Sport and Exercise*, 52. <https://doi.org/10.1016/j.psychsport.2020.101847>
- Prinz, B., Dvořák, J., & Junge, A. (2016). Symptoms and risk factors of depression during and after the football career of elite female players. *BMJ Open Sport & Exercise Medicine*, 2:e000124. <https://doi.org/10.1136/bmjsem-2016-000124>
- Richards, D., & Richardson, T. (2012). Computer based psychological treatments for depression: a systematic review and meta-analysis. *Clinical Psychology Review*, 32(4), 329–342. <https://doi.org/10.1016/j.cpr.2012.02.004>
- Rosenberg, M. *Society and the adolescent self-image*. Revised edition. Middletown, CT: Wesleyan University Press; 1989.
- Räsänen, P., Lappalainen, P., Muotka, J., Tolvanen, A., & Lappalainen R. (2016). An Online guided ACT intervention for enhancing the psychological well-being of University Students: A randomized controlled clinical trial. *Behaviour Research and Therapy* 78, 30–42. <https://doi.org/10.1016/j.brat.2016.01.001>
- Solberg, E.E., Ingjer, F., Holen, A, Sundgot-Borgen, J., & Holme, I. (2000). Stress reactivity to and recovery from a standardized exercise bout: a study of 31 runners practicing relaxation techniques. *British Journal of Sports Medicine*, 34, 268–272. <https://doi.org/10.1136/bjism.34.4.268>
- Sorkkila, M., Ryba, T. V., Selänne, H., & Aunola, K. (2020). Development of school and sport burnout in adolescent student-athletes: A longitudinal mixed-method study. *Journal of Research on Adolescence*, 30(S1), 115–133. <https://doi.org/10.1111/jora.12453>
- Tamminen, K.A., & Holt, N.L. (2010). Female adolescent athletes' coping: A season-long investigation. *Journal of Sports Sciences*, 28(1), 101–114. <https://doi.org/10.1080/02640410903406182>
- Tamminen, K.A., Palmateer, T.M., Denton, M., Sabiston, C., Crocker, P.R.E., Eys, M., & Smith, B. (2016). Exploring emotions as social phenomena among Canadian varsity athletes. *Psychology of Sport and Exercise*, 27, 28–38.
- Trainor, L. R., Crocker, P. R., Bundon, A., & Ferguson, L. (2020). The rebalancing act: Injured varsity women athletes' experiences of global and sport psychological well-being. *Psychology of Sport and Exercise*, 49. <https://doi.org/10.1016/j.psychsport.2020.101713>
- Union of European Football Association (UEFA). Women's football across the national associations. 2016.
- Uphill, M., Sly, D., & Swain, J. (2016). From mental health to mental wealth in athletes: Looking back and moving forward. *Frontiers in Psychology*, 7, 935. <https://doi.org/10.3389/fpsyg.2016.00935>
- Wells, C. S., & Wollack, J. A. (2003). *An instructor's guide to understanding test reliability*. Testing and evaluation services publication, University of Wisconsin.
- Zetterqvist, K., Maanmies, J., Stroem, L., & Andersson, G. (2003). Randomized controlled trial of Internet-based stress management. *Cognitive Behaviour Therapy*, 3, 151–160. <https://doi.org/10.1080/1650607032316>
- Zhang, C-Q, Si, G., Duan Y., Lyu, Y., Keatly, D., & Chan, D.K.C. (2016). The effects of mindfulness training on beginner's skill acquisition in dart throwing: a randomized controlled trial. *Psychology Sports Exercise*, 22, 279–285. <https://doi.org/10.1016/j.psychsport.2015.09.005>