

The Effects of Coach-Created Motivational Climate during the COVID-19 Pandemic on the Prevalence of Anxiety and Depression in Collegiate Student Athletes

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Abstract Although research has shown that the prevalence of ill-being among collegiate student-athletes is greater compared to regular college students and general population, very little is known about the role of coaches in this process. Grounded in the achievement goal and self-determination theories, the aim of this study was to examine the role of coach-created motivational climate on student-athletes' anxiety and depression. A sample for this prospective cohort study was 117 (77 females and 34 males; $M_{age} = 20.24 \pm 1.35$) student-athletes recruited from one university in the Southeastern US. The research team collected self-reported data via email. The results showed high levels of anxiety (71.4%) and depression (17.3%) among the respondents. Females had almost seven times more likely to have anxiety than males (OR = 6.903, CI95% [1.650, 28.830]), but there were no gender differences in the prevalence of depression (OR = 1.166, CI95% [.442, 3.076]). In addition, parameter estimates suggest that coach-created task-involving climate ($\chi^2[1] = -1.21$ [.61], $p = .047$, CI95% [-2.41, -.01]) and autonomy-support ($\chi^2[1] = -1.21$ [.61], $p = .047$, CI95% [-2.39, -.04]) were significant negative predictors of anxiety, whereas controlling motivational climate increased student-athletes' anxiety symptoms. Our findings highlight the need for the task- and autonomy-supportive coaching strategies as preventive measures to support student-athletes' mental health.

Keywords: Collegiate athletes, well-being, ill-being, mental health, motivation

1. Introduction

Despite the benefits that come with being a student-athlete, many student-athletes face unique challenges during their tenure, e.g. long playing seasons, substance abuse, pressure to win and to be a role model, academic pressures, significant time demands, and commercialization of college athletics (Brown, 2014; Cutler & Dwyer, 2020; Dean & Rowan, 2014). In addition, the COVID-19 pandemic has caused additional stress on student-athletes, worsening college students' mental health (Horn, 2020; Lee, Jeong, & Kim, 2021). Considering these unique pressures facing collegiate athletes, it is not surprising that the prevalence of psychological ill-being has been shown to be higher in the collegiate athlete population compared to their non-athlete peers or the general public (Pluhar et al., 2019; Wolanin et al., 2016). Research has shown that approximately 85% of collegiate athletes in the United States (US) suffer from anxiety symptoms during the school year (Brown, 2014; Goldman, 2014), with symptoms being especially prevalent during a competitive season (Thompson & Sherman, 2007). In addition, up to 33% (~148,500) of collegiate athletes experience symptoms of depression yearly (Cutler & Dwyer, 2020), with collegiate athletes being especially

vulnerable to depressive symptoms when injured (Armstrong, 2015).

2. Conceptual Framework

Coaches play a major role in student-athletes' lives (Cote, Yardley, Hay, Sedgwick, & Baker, 1999; Mallett & Cote, 2006). Research has shown that coaches' leadership styles and motivational strategies can impact athletes' attitudes, cognitions, and behaviors (Mageau & Vallerand, 2003; Smoll & Smith, 1989). Although previous research has shown that coach-created motivational climate, i.e. psychosocial climate around students-athletes, is influential in relating to athletes' motivation, well-being and subsequent behaviors (Hodge, Henry, & Smith, 2014; Yukhymenko-Lescroart, Brown, & Paskus, 2015), there is a lack of understanding on how coach-created motivational climate relates to student-athletes' anxiety and depression. Thus, grounded in the Achievement Goal Theory (AGT; Ames, 1992; Nicholls, 1989) and Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2017), the aim of this study was to examine the role of coach-created motivational climate on student-athletes' anxiety and depression.

In this study, we conceptualize coaching environment utilizing AGT (Nicholls, 1989) and SDT (Deci & Ryan, 1985) to understand the influence of coach-created motivational climate on student-athletes' ill-being. Relying on the AGT, motivational climate verbiage was first proposed by Carol Ames (1992) to understand the role of psychosocial environment on academic learning and motivation. Based on the AGT, individuals perceive success either in a task- or ego-oriented manner (Nicholls, 1989). Task-oriented individuals perceive success as self-normative criteria, e.g. mastery, improving skills, whereas ego-oriented perceive success normatively, e.g. winning or being better than others (Nicholls, 1989). In this context, motivational climate can be either task- or ego-oriented facilitating mastery or normative comparisons (Ames, 1992). SDT, on the other hand, is a prominent theory to understand motivational processes leading to human growth, optimal functioning, and well-being (Deci & Ryan, 1985, 2000; Ryan & Deci, 2017). SDT argues that humans have three innate psychological needs of autonomy, competence, and relatedness, which primarily develop in the interaction between the environment and an individual (Deci & Ryan, 2000). In the sports context, for instance, a coaching climate that supports these basic psychological needs (i.e. need-supportive motivational climate) is argued to lead to optimal functioning and well-being, while if the coach-created motivational climate does not support the needs (i.e. climate neglecting or thwarting the needs) that can lead to ill-being (Deci & Ryan, 2000; Manninen & Yli-Piipari, 2021).

It should be noted that in the area of psychological needs and instruction, a vast majority of research has focused on autonomy-supportive instruction and coaching (Aelterman et al., 2019; Gillet, Vallerand, Amoura, & Baldes, 2010; Goffena & Horn, 2021; Reeve & Cheon 2021). Autonomy-supportive coaching is considered a subcomponent of need-supportive coaching, which focuses on fulfilling all three psychological needs (Manninen, Deng, Hwang, Waller, & Yli-Piipari, 2020). Relying on the theoretical frameworks of AGT and SDT and the work of Duda et al. (e.g. Appleton et al., 2016), we operationalized a coach-created climate as empowering or disempowering. Task-involving, autonomy-supportive, and socially-supportive coaching practices are theorized to be empowering coaching practices, whereas ego-involving and controlling coaching practices are considered disempowering (Appleton et al., 2016).

Anxiety is a negative psychological and physiological state characterized by feelings of worry, arousal, apprehension, fatigue, tension, and the activation of the autonomic nervous system elicited by a threat (Spielberger, 1972a; 1989). Typically, perceived dangerous, harmful, or otherwise detrimental stimuli evoke anxiety (Spielberger, 1972b). Depression, on the other hand, is defined as a mental illness that negatively affects a person's feelings, thinking, and action, which leads to a variety of emotional and physical problems because of a feeling of sadness, loss of energy or interest, changes in appetite, sleeping issues, etc. (American Psychiatric Association, 2013). Previous studies have shown that the prevalence of anxiety is higher in a student-athlete population (Davoren & Hwang, 2014; Schaal et al., 2011) compared to the adult athlete population (Gouttebarga et al., 2015; Gulliver et al., 2012; Schaal et al., 2011), and that females experience significantly higher mental distress compared to male counterparts (Allen, 2022; Lee, Jeong, & Kim, 2021). Previous research has shown the prevalence of anxiety in student-athletes to range from 8.6% to 48%, while in the adult athlete population,

it has shown to range from 7.1% to 26% (Davoren & Hwang, 2014; Gulliver et al., 2012; Gouttebarga et al., 2015; Schaal et al., 2011). Compared to the anxiety levels of the general college student population (27.7%), student-athletes' anxiety appears to be similar to higher levels (American College Health Association, 2020). Research on the prevalence of depression has shown that college student-athletes have higher rates of depression ranging from 15.6% to 33.2% (Cox et al., 2017; Davoren & Hwang, 2014; Proctor & Boan-Lenzo, 2010; Wolanin et al., 2016; Yang et al., 2007) compared to the adult athlete population (range 10.3%-27.2%) (Gulliver et al., 2012; Junge & Feddermann-Demont, 2016) and non-athlete college student population (22.5%) (Horn, 2020). In addition, research suggests that team sport athletes may be less likely to suffer anxiety or depression than individual athletes (Pluhar et al., 2019). Finally, there is some early evidence that female student-athletes may experience more depressive symptoms than males (Wolanin et al., 2016). Early evidence suggests that COVID-19 pandemic has elevated mental ill-being among college students (Lee, Jeong, & Kim, 2021; Horn, 2020). Results have shown that 44% of college students experience moderate to severe anxiety with 36% of students having moderate to severe depression, with added vulnerability among female, rural, low-income, and academically underperforming college students (Lee, Jeong, & Kim, 2021). Similarly, another nationwide survey conducted from late May to early June in 2020 revealed that 85% of college students felt increased anxiety during the early months of the pandemic (Timely MD, 2020).

Despite the undeniable role of COVID-19 in student-athletes' ill-being, the important role of coaching climate in well- and ill-being in athletes, in general, or student-athletes, in particular, is not well known. Previous research has shown that empowering coaching practices relate to positive athlete outcomes, e.g. task orientation, enjoyment, and well-being, whereas disempowering coaching has been shown to relate to negative outcomes, e.g. ego-orientation and anxiety (Gjesdal, Stenling, Solstad, & Ommundsen, 2019; Fagerty & Filizzi, 2023; Ramis et al., 2017; Van Puyenbroeck, Stouten, & Vande Broek, 2017). The study by Gjesdal et al. (2019) examining 1,359 youth soccer players (87 teams and 87 coaches) showed that coach - created task-climate relates positively to task-orientation and enjoyment, whereas ego-climate relates positively to ego-orientation and anxiety and negatively to enjoyment. Interestingly, the most negative outcomes were identified when coaches and athletes perceived motivational climate differently (Gjesdal et al., 2019). The study by Van Puyenbroeck et al. (2017) on the national to regional level young adult volleyball players (N = 180) showed that autonomy-supportive motivational climate related positively to participants' perception of task-climate and negatively ego-climate. Finally, research in youth sport athletes (N = 202; 13-14 years old) has shown that autonomy-supportive coaching climate, i.e. a key component of empowering coaching climate, has shown to relate to athletes' psychological well-being. Specifically, this relationship was mediated by the personal and social skills examined in the study (Cronin & Allen, 2015).

Considering the present evidence that suggests that the prevalence of ill-being is greater among student-athletes and athletes compared to regular college students and general population warrants this current inquiry (e.g. Cox et al., 2017; Davoren & Hwang, 2014; Gouttebarga et al., 2015; Gulliver et al., 2012; Schaal et al., 2011). Although an empowering coaching climate has been shown to relate to positive athlete outcomes, this

evidence is preliminary and does not focus specifically on student-athletes. Therefore, the aim of this study was to examine the role of a coach-created motivational climate on student-athletes' anxiety and depression. It was hypothesized that a motivational climate evolving around high task-, autonomy, and social-support would relate to a lower level of anxiety and depression. In the contrary, ego-involving and controlling climate would relate to high anxiety and depression. Task-involving, autonomy-supportive, and socially-supportive coaching practices are theorized to be empowering coaching practices, whereas ego-involving and controlling coaching practices are argued to be disempowering.

3. Methods

3.1. Participants

This study was a prospective cohort study with non-probability convenience sample of 117 (77 females and 34 males; $M_{age} = 20.24 \pm 1.35$) student-athletes recruited from one university in the Southeastern US in November 2020. All student-athletes from 12 scholarship sports (baseball, softball, cheer, track/cross country, equestrian, football, golf, gymnastics, soccer, swimming, and tennis) were eligible to participate in the study. The student-athletes in the sports not offering athletic scholarships were excluded from this study. The respondents were 82.9% White, while 8.5% were Black, 4.3% were White Asian, and .09% White Hispanics. The sample consisted of 14.5% of Freshmen, 27.4% Sophomores, 21.4% Juniors, 32.5% Seniors, and 4.3% were either 5th year undergraduate or graduate students. Student-athletes received no compensation for their participation. Participant consents were collected and university's Institutional Review Boards permission was obtained prior to the study

3.2. Procedures

The study team collected all data via email. Participants received the questionnaire in their university provided email and responded in a web browser either on their phone, laptop, or computer. Participants were sent the questionnaire multiple times in order to get the best possible response rate and were instructed to only fill it out once. The questionnaire did not include identifiable information, such as name or email address, therefore all responses were anonymous.

3.3. Measures

3.3.1. Anxiety and Depression

The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) was used to assess psychological symptoms related to anxiety and depression during the past month. The questionnaire was a 14-item questionnaire (7 items for each) that uses a 4-point Likert scale ranging from 0 = "not at all" to 3 = "most of the time/very often." An example item for anxiety was "I feel cheerful" and for depression "I get sudden feelings of panic." Values between 11 and 21 indicates abnormal values (case), between 8 and 10 borderline abnormal values (borderline case), and between 0 and 7 normal values. The scale has been shown to have strong internal reliability and validity when used in clinical patients as well as in general population (Bjelland, Dahl,

Haug, & Neckelmann, 2002). In this study, internal consistency of this scale was .74 for anxiety and .78 for depression dimensions indicating acceptable reliability.

3.3.2. Coach-Created Motivational Climate

Student-athletes' perceptions of their motivational climate created by the coach was assessed using Empowering and Disempowering Motivational Climate Questionnaire (Appleton et al., 2016). A shortened version of the scale was used utilizing 15 (3 for each dimension) best loading question items (Appleton et al., 2016) measuring participants' perceptions of empowering and disempowering motivational climate. Empowering climate included task-involving (e.g., "My coach tried to make sure players felt good when they tried their best"), autonomy-supportive (e.g., "My coach answered players' questions fully and carefully"), and socially-supportive (e.g., "My coach could really be counted on to care, no matter what happened") constructs, whereas disempowering climate comprised ego-involving (e.g., "My coach yelled at players for messing up") and controlling (e.g., "My coach paid less attention to players if they displeased him or her") constructs. Initial evidence for the reliability and validity of this scale has been provided in previous research (Appleton et al., 2016; Smith et al., 2016). In the current study, internal consistency of the subscales was .82 (task-involving), .70 (autonomy-supportive), .86 (socially-supportive), .72 (ego-involving), and .74 (controlling), indicating an appropriate internal consistency.

3.3.3. Control Variables

The following background variables were collected: age, gender (1 = male, 2 = female), ethnicity, grade level (1 = freshman, 2 = sophomore, 3 = junior, 4 = senior, 5 = 5th year or graduate student), school/sport commitment (1 = sports over academics, 2 = equal emphasis, 3 = academic over school), sport/practice frequency (1 = once / w, 2 = twice / w, 3 = 3 times / w, 4 = 4 or more times per week), years working with the coach (1 = just started, 2 = 6-12 months, 3 = 1-2 years, 4 = more than 2 years), player status (1 = regular starter, 2 = sometimes starter [starts 50% or more], 3 = non-starter [starts less than 10%], and pro career aspirations [1 = yes, 2 = maybe, 3 = no]).

3.4. Data Analysis

Prior to the main analyses, data were screened for normality and multivariate outliers (Tabachnick and Fidell, 2013). Data were deemed as normally distributed, and the analyses did not identify any outliers. Next, preliminary, descriptive analyses, e.g. internal consistency and aggregated means and standard deviations, were conducted. To estimate risk estimate (odds ratio = OR) for gender and career aspirations were calculated using SPSS's crosstabs function. Finally, to examine the primary effects, e.g. prevalence of symptomatic data and the examination the role of coach-centered motivational climate on student-athletes' ill-being, we conducted an ordinal logistic regression analysis (McChullagh, 1980). Test of overall model fit was conducted using deviance and likelihood ratio tests; and model adequacy was conducted using Wald test, goodness of fit, and pseudo R-squared tests (Field, 2018; Petrucci, 2009). All analyses were performed using IBM SPSS V.23.

4. Results

Preliminary results showed that 63.2% (74) of the student-athletes were in the middle of their competitive season and 28.2% (33) were currently preparing for the season. In total, 10 students (8.6%) did not know if the COVID situation will allow their season to be played during school year 2020-2021. A great majority of these students practiced four or more times per week (97.4%, $n = 99$). Total 62.4% of the student-athletes have worked with the coach(es) for more than one year, and 37.6% have worked with the same coach(es) for more than two years. Around 40% (47) of the students were starters while 26.5% were irregular starters. When asked about the school/sport commitment, 37.6% (44) of the participants emphasized sports over academics, 41.9% (49) of the student-athletes had an equal emphasis, where 20.5% (24) of the students focused primarily on academics. Finally, 21 athletes (17.9%) were certain to pursue professional career with same number of students were considering professional career. Seventy-five (64.1%) students-athletes did not see themselves to pursue a professional career. There were no gender differences in any of the reviewed variables above.

Our data showed that 70 (71.4%) student-athletes who responded to our study had clinical levels of anxiety, whereas 19 (19.4%) had symptoms of borderline anxiety. Similar patterns were evident in depression, as our data showed that 17 student-athletes (17.3%) had depressive symptoms of the level that can be diagnosed as depression, whereas 56 student-athletes (57.1%) had symptoms of borderline depression. Females had a greater prevalence of anxiety, with females almost seven times more likely to have anxiety than males (OR = 6.903, CI95% [1.650, 28.830]). There were no statistically significant differences between genders in depression (OR = 1.166, CI95% [1.442, 3.076]). In addition, student-athletes who had professional career aspirations were less likely to have anxiety (OR = .583, 95% CI [1.158, 2.157]), but there were no statistically significant differences

in the prevalence of depression (OR = 1.094, CI95% [1.443, 2.857]). Student-athletes perceived their motivation climate to be rather low in empowerment but higher in disempowerment, and there were no gender differences in the perceptions of any of the motivational climate dimensions.

Table 1. Summary of ordinal logistic regression analysis for anxiety.

Variable	β	S.E.	p	95% CI
Gender	1.37	.50	.006	[.40, 2.34]
CTask	-1.21	.61	.047	[-2.41, -.41]
CSos	-0.61	.48	.203	[-1.60, .33]
CAut	-1.24	.61	.042	[-2.39, -.40]
CEgo	-.31	.35	.378	[-.38, .99]
CContr	1.18	.60	.049	[.48, 2.51]

Note. CI = confidence interval; CTask = coach-created task-involving climate; CSos = coach-created socially-supportive climate; CAut = coach-created autonomy supportive climate; CEgo = coach-created ego-involving climate; CContr = coach-created controlling climate.

Table 2. Summary of ordinal logistic regression analysis for depression.

Variable	β	S.E.	p	95% CI
Gender	-.27	.45	.552	[-1.14, .61]
CTask	-.54	.46	.241	[-1.44, -.40]
CSos	-.53	.39	.176	[-1.30, .24]
CAut	-1.20	.49	.048	[-2.10, -.26]
CEgo	.08	.30	.787	[-.51, .70]
CContr	.43	.34	.199	[-.23, 1.10]

Note. CI = confidence interval; CTask = coach-created task-involving climate; CSos = coach-created socially-supportive climate; CAut = coach-created autonomy supportive climate; CEgo = coach-created ego-involving climate; CContr = coach-created controlling climate.

Table 3. Regression coefficients and significance tests for the study variables.

		Estimate	SE	Wald	df	p	CI 95%	
							Lower bound	Upper Bound
Anxiety								
Threshold	[Anxiety = 0.00]	1.19	2.23	.29	1	.593	-3.180	5.568
	[Anxiety = 1.00]	2.81	2.24	1.57	1	.210	-1.581	7.208
Location	Gender	1.37	.50	7.51	1	.006	.389	2.341
	CTask	-1.21	.61	3.93	1	.047	-2.411	-.041
	CSos	-.61	.48	1.63	1	.203	-1.547	.328
	CAut	-1.24	.58	3.17	1	.042	-2.387	-.035
	CEgo	.31	.35	.78	1	.378	-.375	.987
	CContr	1.18	.60	4.20	1	.049	.048	2.506
Depression								
Threshold	[Depression = 0.00]	1.67	1.79	.86	1	.353	-1.852	5.182
	[Depression = 1.00]	4.53	1.86	5.94	1	.015	.886	8.173
Location	Gender	-.27	.45	.35	1	.552	-1.143	.611
	CTask	-.54	.46	1.38	1	.241	-1.441	-.362
	CSos	-.53	.39	1.83	1	.176	-1.293	.238
	CAut	-1.20	.49	3.79	1	.048	-2.097	-.026
	CEgo	.08	.30	.07	1	.787	-.513	.677
	CContr	.43	.34	1.65	1	.199	-.227	1.090

Note. CI = confidence interval; CTask = coach-created task-involving climate; CSos = coach-created socially-supportive climate; CAut = coach-created autonomy supportive climate; CEgo = coach-created ego-involving climate; CContr = coach-created controlling climate.

Pearson's correlation analysis for the covariates determined that out of all potential covarying variables only gender was significantly correlated with anxiety ($r = .30$). Thus, only gender was included as only covariate in the ordinal logistic regression analysis. Model fitting information suggested that there was a significant improvement in the fit of the Final model relatively to the Intercept model in anxiety ($\chi^2[6] = 19.44, p = .003$) and depression ($\chi^2[6] = 12.98, p = .012$). In addition, Pearson chi-square test ($\chi^2[184] = 187.25, p = .419$) and the deviance test ($\chi^2[184] = 132.99, p = .998$) were both non-significant suggesting a good model fit in anxiety and depression (Pearson Chi-square test: $\chi^2[184] = 183.49, p = .497$, deviance test: $\chi^2[184] = 176.75, p = .636$). Finally, pseudo R-Square test (Nagelkerge test) suggested that 15.8% of the variance in student-athletes' anxiety and 11.3% in depression was explained by each model.

Parameter estimates suggest that gender was a statistically significant predictor on the clinical levels of anxiety disorder with girls, compared to boys, having 1.3 times higher probability to belong to the next anxiety category ($\chi^2[1] = 1.37[.50], p = .006$, CI95% [.40, 2.34]). Next, coach-created task-involving climate and autonomy-support were statistically significant negative predictors of anxiety. For every unit change for task-involving climate, anxiety score declined 1.21 units ($\chi^2[1] = -1.21[.61], p = .047$, CI95% [-2.41, -.01]), whereas the unit change was for autonomy was -1.24 ($\chi^2[1] = -1.21[.61], p = .047$, CI95% [-2.39, -.04]). Finally, controlling-climate increased anxiety with one unit increase in controlling-climate initiating 1.18 units change in anxiety ($\chi^2[1] = -1.18[.60], p = .049$, CI95% [.05, 2.51]). For depression, autonomy was the only statistically significant factor ($\chi^2[1] = -1.20[.49], p = .048$, CI95% [-2.10, -.26]) with depression declining 1.21 units every time when autonomy-support declined one unit.

5. Discussion

In this study, we aimed to investigate the differences between empowering and disempowering coach-created motivational climates on student-athletes' anxiety and depression. Our findings showed that the prevalence of anxiety and depression is high among student-athletes. In addition, the findings suggested that coach-created task-involving climate and autonomy-support were adaptive motivational environments that prevented anxiety symptoms, whereas controlling motivational climate increased student-athletes' anxiety symptoms.

Our study showed that 71.4% of student-athletes reported experiencing clinical anxiety levels, which is consistent with previous research findings that found that most student-athletes suffer from anxiety symptoms during a school year (Brown, 2014; Goldman, 2014). Previous research has shown that collegiate student-athletes' anxiety symptoms increase when they face stressful situations (Thompson & Sherman, 2007) and insurmountable difficulties (NCAA, 2016). Similarly, in line with the previous research (Cox et al., 2017; Davoren & Hwang, 2014; Wolanin et al., 2016), our study showed that around 17% of the student-athletes had depressive symptoms of the level that can be diagnosed as depression. In contrast, more than half of the student-athletes had symptoms of borderline depression. The prevalence of depression in our sample was similar in size compared to the findings of the previous studies that have shown student-athletes' depression ranging between 15% and 33.2% (Cox et al., 2017; Davoren & Hwang, 2014; Proctor & Boan-Lenzo, 2010; Wolanin

et al., 2016; Yang et al., 2007). However, our study did not support the previous findings that have shown that team sport athletes may be less likely to suffer anxiety or depression compared to individual sport athletes (Pluhar et al., 2019). It is noteworthy that even the student-athletes who compete in individual sports are a part of their team, and their athletic success will be measured in individual and team achievement.

Our study findings showed that female student-athletes had higher anxiety levels than male student-athletes, with females almost seven times more likely to have anxiety than males. The findings of this study corroborate the previous evidence on heightened female student-athlete vulnerability for anxiety (Lee, Jeong, & Kim, 2021; Storch et al., 2005; Wolanin et al., 2016). Interestingly, student-athletes with professional career aspirations were less likely to have anxiety. One would assume that serious athletic career aspirations could provoke anxiety, not reduce it. However, our study did not find any gender or professional aspiration differences in depression. Notably, our study collected many other control variables and examined their role in anxiety and depression, but only gender was a statistically significant predictor. Finally, it is noteworthy that other than gender and professional career aspiration, no other measured variables, e.g. grade level, commitment, sport/practice frequency, years working with the coaching team, and player status, were related to anxiety or depression symptoms.

One of the key objectives of this research was to examine the role of coach-created motivational climate on student-athletes' ill-being. The findings partially supported the conceptual assumptions suggesting that an empowering motivational climate should yield positive outcomes while the role of a disempowering motivational climate should be inverse (Appleton et al., 2016). Our study found that our model explained 15.8% and 11.3% of the variance in student-athletes' anxiety and depression, respectively, suggesting that a large portion of anxiety and depression are due to other reasons, e.g. biological and environment factors, beyond the coach-created motivational climate in their sport environment. It is noteworthy that task-involving and autonomy-supportive climates prohibited anxiety while controlling climate increased anxiety. These findings supported our hypotheses and theoretical postulations of AGT and SDT (Deci & Ryan, 2000; Nicholls, 1989) as well as previous research findings (Cronin & Allen, 2015; Gjesdal, Stenling, Solstad, & Ommundsen, 2019; Van Puyenbroeck, Stouten, & Vande Broek, 2017). However, social-support and ego-involvement did not relate to students-athletes' anxiety and depression. It is noteworthy that coach-created autonomy-climate was only a statistically significant contributor that prohibited student-athletes' depression. The size of this effect was moderate, with one unit increase in autonomy-support decrease 1.2 units of depression. This finding supports the theoretical postulation of SDT (Ryan & Deci, 2017), and findings that have shown school teachers' autonomy-support reducing middle school students' anxiety and depression (Yu, Li, Wang, & Zhang, 2016) and several indicators of adults' mental health during an exercise referral program (Rouse, Ntoumanis, Duda, Jolly, & Williams, 2011).

The following limitations should be considered when interpreting the findings of this study. First, about 20% of all approached student-athletes responded to the study questionnaire. Although our sample consisted of student-athletes from all 12 scholarship sports in one Southeastern 4-year university, our

sample does not represent all students-athletes in the sample university nor the other universities in the US. To improve, the external validity of the findings of our findings, future studies should be conducted to collect a nationally representative sample to examine the mental health of students-athletes in the US. Second, this study used the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) to measure student-athletes' mental health. This scale has been designed to be used in the clinical setting, not the student-athlete population. This is a threat to the internal validity of the findings, even though this scale has also been validated to be used in the general population (Bjelland, Dahl, Haug, & Neckelmann, 2002). Finally, this study was conducted in November 2020, during the first year of COVID-19. It is impossible to determine the role of COVID-19 in student-athletes' ill-being, but it is logical to assume that COVID-19 played a role in this process. In conclusion, this study showed high levels of both anxiety and depressions. Similarly, our research revealed that the coach plays a role in student-athletes' anxiety and depression, although understanding of other biological (e.g. neurological biomarkers, structural brain morphology) and environment factors (e.g. gender, socioeconomic status, and parents) surrounding student-athletes are needed to fully understand ill-being in this population (Narmandakh, Roest, Jonge, & Oldehinkel, 2021). Finally, this study advocates task- and autonomy-supportive coaching strategies as preventive measures to harness student-athletes' mental health. Instructional strategies, e.g. focusing on individual mastery and improvement and sharing information and why we are practicing, are strategies to harness athletes' task- and autonomy-support (Campbell, Manninen, & Yli-Piipari, 2022).

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