

## Comparison of psychological constructs in university athletes during a national competition

### Comparación de constructos psicológicos en deportistas universitarios durante una competición nacional

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**Abstract.** Student-athletes have dual-role demands because in addition to being competitive level athletes, they have academic responsibilities to fulfill. This situation could generate psychological distress that may affect their quality of life. The purpose of the study was to compare psychological constructs in college athletes participating in the Mexican University National Games. The sample comprised 402 athletes (Males = 210, Females = 192) who completed measures of burnout, sports climate, self-esteem, depression, competitive anxiety, and body image. Athletes showed low self-esteem and burnout risk; females showed high self-esteem and males low anxiety. Team sports showed high depression, low anxiety and good sports climate scores. Southern athletes were prone to burnout and athletes from the center of the country showed high self-confidence. In conclusion, psychological constructs were different in males and females from individual and team sports and regions of Mexico during sports completion.

**Key words:** Burnout, sports climate, depression, anxiety.

**Resumen.** Los estudiantes deportistas tienen demandas de doble función porque además de ser atletas de nivel competitivo, tienen responsabilidades académicas que cumplir. Esta situación podría generar malestar psicológico que puede afectar su calidad de vida. El propósito del estudio fue comparar constructos psicológicos en deportistas universitarios que participaron en los Juegos Nacionales Universitarios Mexicanos. La muestra estuvo compuesta por 402 atletas (hombres = 210, mujeres = 192) que completaron medidas de agotamiento, clima deportivo, autoestima, depresión, ansiedad competitiva e imagen corporal. Los atletas mostraron baja autoestima y riesgo de agotamiento; las mujeres mostraron alta autoestima y los hombres poca ansiedad. Los deportes de equipo mostraron alta depresión, baja ansiedad y buenos puntajes de clima deportivo. Los atletas del sur eran propensos al agotamiento y los atletas del centro del país mostraron una alta confianza en sí mismos. En conclusión, los constructos psicológicos fueron diferentes en hombres y mujeres de deportes individuales y de equipo y regiones de México durante la finalización de los deportes.

**Palabras claves:** Burnout, clima deportivo, depresión, ansiedad.

#### Introduction

University students involved in sports activities representing their institutions have the challenge to balance the psychological pressure of being students and keeping a high motivation during sports training and competition. Thus, a university athlete has a dual-role, first, being a proficient student, and second, to achieve superior athletic performance. In both roles, the student-athlete is supposed to achieve the highest levels; however, several factors could potentially jeopardize this outcome. Sports psychology allows the understanding of the factors potentially affecting sports performance (Fargier, Collet, Moran, & Massarelli, 2017).

There is evidence suggesting that some of the factors that affect athletes before, during, and after competitions can be the burnout syndrome, sports climate, self-esteem, anxiety, and depression. These elements can cause behavioral disorders that can affect the physical and mental health of students (de Bruin, Oudejans, Bakker, & Woertman, 2011; Goltz, Stenzel, & Schneider, 2013; Varnes et al., 2013). The burnout syndrome has been studied since the 70's in the workplace and since the 80's it has been analyzed in sports of different competitive levels (García-Parra, González, & Garcés de los Fayos, 2016). According to Reynaga-Estrada et al. (2017), the burnout syndrome is the product of chronic stress that is displayed by chronic fatigue (physical and psychological), anger, and feelings of self-criticism, helplessness, negativity and irritability, among others. The chronic stress that precedes the burnout syndrome is recognized as a major risk factor for mental health disorders (Schönfeld et al., 2016).

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In the sports context, the burnout syndrome can occur when athletes show generalized stress that alters training and competition. The stress is shown as a lack of pleasure, satisfaction, or motivation, which increases levels of depression (Pinto Guedes & Gaspar, 2016). It can take many years for an athlete to develop the burnout syndrome and it can sometimes be undetectable to the athlete and the staff. Furthermore, this response is individual, cumulative, and progresses severely as a chronic stress response (Pinto Guedes & Gaspar, 2016). The accumulated evidence published over the years has suggested that the burnout syndrome affects athletes in different ways such as physical and emotional fatigue, feeling of poor performance, and actual poor athletic performance (De Francisco, de Los Fayos, & Arce, C. 2015).

Another factor that can affect the athlete's success or failure is the sport climate. Research on this topic has considered some psychological elements associated with the motivation of athletes in the context of their sport, the most important being the influence of coaches (Jõesaar, Hein, & Hagger, 2012). Behavioral training provides feedback on task orientation and provides intrinsic motivation. For this reason, this type of behavior is perceived as an inherent supportive and autonomous task climate; that is, task-oriented athletes are more likely to be aware and resilient (Nordin-Bates, Quedsted, Walker, & Redding, 2012). Ntoumanis, Taylor and Thøgersen-Ntoumani (2012), indicate that the behaviors of partners and coaches have a great influence on the motivation of team sports and on the behavioral outcomes that promote long-term stability. Consequently, goal-oriented tasks relate to the personal priorities and independence of athletes.

An additional factor that can affect an athlete is the self-esteem, considered as multifunctional. It consists of specific components of domains such as academic, social and physical. The latter involves body satisfaction and sports competition (Haugen, Ommundsen, & Seiler, 2013). Oteiza et al. (2011), suggest that body satisfaction is formed with the general strength of self-esteem and that this forms the character, personality, and human behavior, as well as that it can influence health and sports performance. Therefore, those athletes who practice voluntary physical exercise for more hours have a greater perception of body image, which inversely correlates with concern about weight and, therefore, positively with self-esteem (Cuervo, Cachón, González, & Zagalaz, 2017; Pastor Ruiz, García Merita, & Balaguer Solá, 2006).

Coaches and athletes are interested in studying different mood states, such as depression. Gallego et al. (2016), studied the correlation between depression and popular and physical sports (e.g., yoga, tai-chi, mindfulness). Those participating in these activities reduced depressive symptoms at all levels of sports groups where it is necessary to demand the maximum mental and psychological effort. Based on this premise, Tenza, García and de Los Fayos. (2016), reported on a case study in a Spanish target shooter who suffered from depression, finding that it was reduced after 48 intervention sessions compared to other moods. According to Brandão et al. (2015), it is important to study the association between psychological and physical performance in athletes. It is known that mood modulates intensity in other affective dimensions and affects sports performance (Andrade, España & Rodríguez, 2016). Moya, Sarabia and Torres-Luque. (2016), suggest that moods vary in athletes according to their training load.

The cognitive assessment of athletes generates transient emotional states characterized by subjective tension and apprehension that are consciously perceived (i.e., anxiety). These signs can be observed by the increased activity of the autonomic nervous system on physiological clues such as increases in heart rate, pupil dilation, and perspiration (Granada et al., 2016). It is also known that sport competitions cause anxiety, which produces a behavioral disposition in athletes that can cause a perceived threat that can negatively affect the athlete's sports performance (Laguata Vilaña, 2018). According to Granada and Aguirre-Loaiza (2014), anxiety increases as the competitive activity progresses and can vary according to sociodemographic conditions and sports experience. Others (Aguirre-Loaiza & Ramos Bermúdez, 2011; Loaiza & Gutiérrez, 2014), suggest intrinsic and extrinsic motivational factors build the motivational profile of university athletes, which may be associated with different levels of anxiety. Furthermore, it is known that anxiety varies according to sport modality and gender (Arias Padilla, Cardoso Quintero, Aguirre-Loaiza & Arenas, 2016).

Another psychological construct that has been studied in athletes is the body image. This is defined as the self-representation that a person has about their body (Chacón-Araya & Moncada-Jiménez, 2013). In general, athletes who perform well have better self-perceived body image than those who do not (Varnes et al., 2013). However, in a study involving 156 male athletes (Pathak, Goltz & Mari, 2013), it was found that approximately

25% had some degree of body dissatisfaction and, at the same time, it was related to eating disorders, a condition previously described in female athletes (Plateau, Arcelus, Leung & Meyer, 2017).

Based on the previous context and given the importance of studying psychological factors that can affect the development of student-athletes, it was decided to describe Mexican university athletes. Therefore, the purpose of this study was to compare the psychological constructs of Mexican athletes in individual and team sports participating in a national competition.

## Methods

### Participants

Volunteers from 15 States of Mexico competed in the National Inter-Polytechnic University Games in Guanajuato, México. The sample comprised 402 athletes (Males = 210, Females = 192). The athletes were recruited from the volleyball, soccer, basketball, taekwondo, track and field teams.

### Measurement instruments and procedures

The study was conducted following approval of the Organizing Committee and the Coaches Committee. Athletes received an explanation about the purpose of the study and read and signed an informed consent. Female and male athletes were randomly invited to represent both individual and team sports. These categories were created *a priori* for further statistical analyses.

The following instruments were used to measure psychological constructs. The Burnout Measurement (BM) was used to identify the risk of suffering mental and physical fatigue (i.e., burnout). This test is comprised of 21 items based on a Likert scale from 1 (totally false) to 7 (for totally true). We used the Spanish version of Fernández-Castro, Doval, Edo and Santiago (1994), which shows logic validity and a very high internal consistency ( $\alpha = 0.93$ ) in a sample of 1346 participants.

The Sports Climate Questionnaire S-SCQ (Balaguer, Castillo, Duda, & Tomás, 2009), was used to ask about their sports experiences. This instrument has 15 items, in which 1-2 means nothing true, 3-5 something true, and 6-7, true. It has unifactorial validity based on confirmatory factor analysis (CFA) and good internal consistency ( $\alpha = 0.96$ ).

The Competitive State of Anxiety Inventory-II

(CSAI-2) (Cox, Martens & Russell, 2003), a multi-dimensional inventory based on 17 items, was used to determine somatic anxiety (SA), cognitive anxiety (CA), and self-esteem (SE). Answers are given on a Likert scale from 1-4, where 1-nothing, 2-a little, 3-moderate, and 4-sufficient. To obtain the total score, items are summed up for every component and then divided by the number of items and multiplying by 10. The score varies for every scale from 10-40 points. This inventory has reported a satisfactory internal consistency for the three factors (SA  $\alpha = 0.80$ , CA  $\alpha = 0.83$ , SE  $\alpha = 0.79$ ), and high reliability through exploratory and CFA (Andrade Fernández, Lois Ríó & Arce Fernández, 2007).

To measure self-esteem, the Rosenberg Scale was used, with 0.76 and 0.87 validity and 0.80 reliability (Rosenberg, 1965). This scale estimates how people value themselves. It has 10 questions, answers varying from 1 (strongly agree), 2 (agree), 3 (disagree) and 4 (strongly disagree). This scale allows having a minimum of 10 and a maximum of 40 pts. If the participants score 0-25 points, self-esteem is considered low, from 26-29, normal, and 30-40 adequate self-esteem.

The Major Depression Inventory (MDI) instrument was used to measure depression (Nebreda & Aliaga, 2003). It has 12 items using the Likert scale from 0-5, where 0 means never and 5 means depression all the time. The total score is taken from the sum. A higher score means a deep depression. It has been reported that this test has a high sensitivity (0.82-0.86) and adequate validity and reliability (Bech et al., 2001; Bech et al., 1997).

Finally, athletes completed the Body Image Assessment Scale (Thompson & Gray, 1995). This scale has nine female and male body images, each one with its corresponding rate from 1-9 (from left to right). This scale has a concurrent validity of 0.71 with body weight and 0.51 with body mass index (BMI), and high reliability ( $r = 0.78$ ) using the test and then re-testing one week later. To obtain the data every person was asked to read the following statement: «Please write an «X» under the body image of which you would want to look like in the future». The difference between the present score and the desirable score is considered as body satisfaction (or body dissatisfaction).

### Statistical analysis

The data were analyzed with the IBM-SPSS Statistics package, version 20. The mean and standard deviation ( $M \pm SD$ ) are presented as measures of central tendency and variability for continuous data and frequencies and

percentages for categorical variables. The non-parametric  $\chi^2$  test was used to determine associations between the categorical variables of gender, sports category (i.e., individual, group), regions of the country, and the psychological variables burnout, self-esteem, and body image.

We planned to use MANOVA parametric statistics; however, 3-way factorial MANOVAs were not calculated since several of the 2-way interactions had empty cells, which reduced the power of the test. Thus, 2 x 2 factorial MANOVA (gender x sports category) were calculated for the dependent variables burnout, self-esteem, sports climate, competitive anxiety, depression, and body image. One-way MANOVAs were calculated for regions of the country for the dependent variables burnout, self-esteem, sports climate, competitive anxiety, depression, and body image.

Finally, multiple linear regression analysis with the stepwise method was used to predict the scores of the psychological variables using age, gender, sports category and regions of the country as predictors. The categorical predictor variables were recoded and transformed into «dummy variables» for the analysis: gender (1 = male, 0 = female), sports category (1 = individual, 0 = team), regions (-1 = north, 0 = central, 1 = south). Statistical significance was set *a priori* at  $p < 0.05$ .

## Results

Participants were 402 athletes (Males = 210, 52.2%, Females = 192, 47.8%). For statistical analyzes they were grouped into the categories of individual sports (n = 133; 33.4%) and team sports (n = 265; 66.6%). The athletes represented 15 States of the Mexican Republic; however, for statistical analysis purposes, they were grouped into three zones: a) North (Durango, Sinaloa, and Zacatecas), b) Central (Aguascalientes, Celaya, State of Mexico, Guanajuato, Hidalgo, Jalisco, Morelos, Puebla, Querétaro, Tabasco, and Veracruz), and c) South (Quintana Roo). Thus, 102 athletes from the north (25.4%), 273 from the center (67.9%), and 27 athletes from the south (6.7%) of Mexico were analyzed. The

Table 1.  
Descriptive statistics of the athletes by sport category and gender (n = 402).

Variables	Individual Sports (n = 133)		Team Sports (n = 265)	
	Females (n = 73)	Males (n = 60)	Females (n = 116)	Males (n = 149)
Age (yr.)	20.3 ± 2.2	20.6 ± 2.2	20.0 ± 1.7	20.7 ± 2.2
Self-esteem (0-40 pts.)	23.4 ± 3.0	22.3 ± 3.6	22.7 ± 3.5	21.6 ± 4.3
Burnout (pts.)	49.4 ± 18.6	46.1 ± 16.9	46.2 ± 20.4	49.4 ± 17.2
Depression (pts.)	55.2 ± 13.8	55.8 ± 11.4	60.5 ± 13.9	56.6 ± 11.5
Body image (pts.)	17.7 ± 10.8	18.3 ± 10.4	18.8 ± 10.6	18.1 ± 6.4
Somatic anxiety (pts.)	21.4 ± 6.7	18.9 ± 6.3	19.5 ± 6.8	19.2 ± 6.7
Cognitive anxiety (pts.)	24.9 ± 8.0	20.3 ± 6.8	21.9 ± 7.3	19.6 ± 7.1
Sports climate (pts.)	81.9 ± 19.9	80.0 ± 16.4	88.5 ± 16.4	85.3 ± 18.1

characteristics of the participants by gender are presented in Table 1.

Based on the Rosenberg Scale, a low (83.5%), normal (15.7%), and adequate (0.7%) self-esteem was found in all athletes. An association was found between gender ( $\chi^2 = 6.06$ ;  $p = 0.048$ ), sports category ( $\chi^2 = 7.36$ ;  $p = 0.025$ ) and self-esteem categories. Among males, the proportion of athletes with low self-esteem (87.6%) was higher than those with normal (11.5%) and adequate (1.0%) self-esteem. A similar pattern was followed by females, with low self-esteem (79.2%), normal (20.3%), and adequate (0.5%). In athletes who participated in individual sports, there was a higher proportion with low self-esteem (78.0%), than those with normal self-esteem (22.0%). Similarly, those who participated in team sports had low self-esteem (86.4%), normal (12.5%), or adequate (1.1%) self-esteem.

The burnout risk categories were different in athletes, with lower risk (48.8%), low risk (33.3%), risk situation (11.7%), and athletes with burnout (6.2%). An association was found between gender ( $\chi^2 = 12.48$ ;  $p = 0.006$ ) and the regions of the country ( $\chi^2 = 24.83$ ;  $p = 0.001$ , Figure 1) and the burnout risk categories. Among males, the categories of the minor (40.5%) and low risk (38.6%) were higher than the categories of risk situation (14.3%) and burnout (6.7%). A similar pattern was followed by females, with a higher proportion of athletes in the categories of the minor (57.8%) and low risk (27.6%) and a lower proportion in the categories of risk situation (8.9%) and burnout (5.7%).

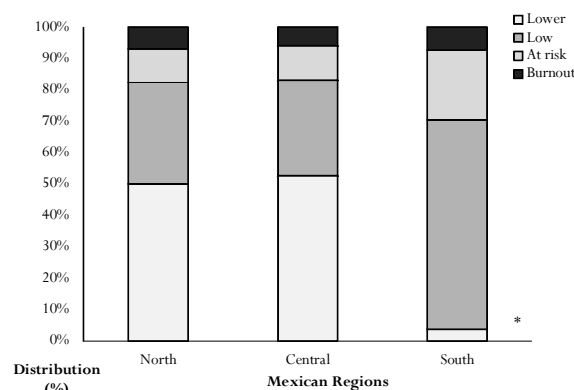


Figure 1. Proportion of Mexican athletes at risk of burnout by region of the country. \*  $p < 0.05$  with respect to the other categories.

The interaction of the MANOVA 2 x 2 test (gender x sport category) was not significant (Wilk's  $\lambda = 0.99$ ;  $p = 0.838$ ;  $\eta^2 = 0.014$ ); However, multivariate main effects were found for gender (Wilk's  $\lambda = 0.91$ ;  $p < 0.001$ ;  $\eta^2 = 0.087$ ) and sport category (Wilk's  $\lambda = 0.93$ ;  $p = 0.002$ ;  $\eta^2 = 0.068$ ). The analysis of main multivariate

effects showed differences by gender in self-esteem ( $p = 0.003$ ;  $\zeta^2 = 0.023$ ) and cognitive anxiety ( $p < 0.001$ ;  $\zeta^2 = 0.049$ ). Thus, females showed higher self-esteem scores than males ( $23.1 \pm 0.3$  vs.  $21.8 \pm 0.3$  pts.), and males showed lower scores in cognitive anxiety than females ( $19.9 \pm 0.6$  vs.  $23.4 \pm 0.6$  pts.). The analysis of main multivariate effects showed differences by sports category in depression ( $p = 0.004$ ;  $\zeta^2 = 0.022$ ), cognitive anxiety ( $p = 0.020$ ;  $\zeta^2 = 0.015$ ) and sports climate ( $p = 0.003$ ;  $\zeta^2 = 0.025$ ). Thus, athletes who participated in team sports reported higher depression scores than athletes who participated in individual sports ( $59.6 \pm 0.8$  vs.  $55.5 \pm 1.2$  pts.). Athletes who participated in team sports reported lower scores in cognitive anxiety than athletes who participated in individual sports ( $20.7 \pm 0.5$  vs.  $22.6 \pm 0.7$  pts.). Finally, athletes who participated in team sports reported higher scores in the sports climate than athletes who participated in individual sports ( $86.9 \pm 1.1$  vs.  $80.9 \pm 1.6$  pts.).

The one-way MANOVA test for the country's regions was not significant (Wilks's  $\lambda = 0.93$ ;  $p = 0.102$ ;  $\zeta^2 = 0.035$ ); However, differences were found between the regions in burnout ( $p = 0.009$ ;  $\zeta^2 = 0.025$ ) and self-confidence ( $p = 0.029$ ;  $\zeta^2 = 0.019$ ). Thus, athletes from the southern region of the country had higher burnout scores ( $58.5 \pm 3.7$  pts.) than athletes from the northern region ( $46.2 \pm 1.9$  pts.;  $p = 0.009$ ) and central ( $47.3 \pm 1.1$  pts.,  $p = 0.010$ ) of the country. Athletes from the central region had higher self-confidence scores than athletes from the northern region of the country ( $28.8 \pm 0.5$  vs.  $26.2 \pm 0.9$  pts.;  $p = 0.026$ ).

The significant predictors found by the multiple linear regression analysis for self-esteem were the participant's gender ( $p = 0.001$ ;  $R^2 = 0.025$ ), for burnout the country's region ( $p = 0.049$ ;  $R^2 = 0.010$ ), for the sports climate ( $p = 0.002$ ;  $R^2 = 0.024$ ) and depression ( $p = 0.007$ ;  $R^2 = 0.018$ ) the sports category, and for cognitive anxiety the gender ( $p < 0.001$ ;  $R^2 = 0.047$ ) and the sports category ( $p = 0.018$ ;  $R^2 = 0.013$ ) (Table

2). There were no significant predictors of body image, and somatic anxiety.

## Discussion

The purpose of this study was to compare psychological constructs that could influence the athletic performance of student-athletes competing in a national tournament in Mexico. The results support the existing research in influential variables and those related to burnout (Chen, 2013; Chen & Kee, 2008; De Francisco, Arce, Vílchez & Vales, 2016; Dubuc-Charbonneau & Durand-Bush, 2015; Frank, Nixdorf & Beckmann, 2017; Gabana, Steinfeldt, Wong & Chung, 2017; Grobbelaar, Malan, Steyn & Ellis, 2011).

Evidence of athlete's comprehensive training (i.e., physical and mental) (DeFreese & Smith, 2014), suggest that burnout can exacerbate other variables (i.e., cognitive and emotional anxiety) even outside the sport climate results, which were similar to those found in the present study were males scored low in cognitive anxiety and females showed good self-esteem scores. This may represent satisfactory scores in burnout results in agreement with previous studies (Olivares Tenza et al., 2018; Villarreal-Ángeles et al., 2017).

There is evidence suggesting a correlation between burnout and depression (De Francisco et al., 2016; Dubuc-Charbonneau & Durand-Bush, 2015; Frank et al., 2017; Grobbelaar et al., 2011). There may be a clear association between the different burnout subscales and depression. In the present study, a small number of athletes with burnout symptoms was found, which also revealed low levels of depression for both genders in individual sports; only athletes from the central region of the country show higher scores than those from other regions. Although an extensive search was carried out in electronic databases, we did not find studies reporting the association between levels of burnout with country regions to discuss our findings. We can speculate that Mexico's central region maintains a greater number of competitions, and therefore, athletes are more likely to burnout (Gustafsson et al., 2018). However, it is necessary to carry out studies on burnout levels in different regions of Mexico.

Anxiety, a negative emotion, affects athletes during competition since they consider that it is debilitating for sports performance. There is evidence showing that winning depends to a large extent on how much control over anxiety an athlete may have. Anxiety consists of two subcomponents, cognitive and somatic (Singh &

Table 2.  
Multiple linear regression coefficients showing the predictors of psychological variables (bold) in Mexican student-athletes.

Variables	Unstandardized coefficients		Standardized coefficients		t	p =	IC 95% de B	
	B	SE	$\beta$				Lower limit	Upper limit
Self-esteem								
Gender	-1.24	0.39	-0.16		-3.21	0.001	-1.99	-0.48
Burnout								
Region	3.34	1.69	0.10		1.97	0.049	0.01	6.67
Sports climate								
Sport category	-5.85	1.86	-0.16		-3.14	0.002	-9.51	-2.19
Depression								
Sport category	-3.64	1.35	-0.35		-2.70	0.007	-6.30	-0.99
Cognitive anxiety								
Gender	-3.10	0.74	-0.21		-4.19	0.001	-4.56	-1.65
Sport category	1.87	0.79	0.12		2.38	0.018	0.33	3.42

Note: Dummy codification: gender (1 = male, 0 = female), sport category (1 = individual, 0 = team), regions (-1 = North, 0 = Central, 1 = South).



Gaurav, 2011); the results of the present study show low anxiety scores, with male athletes scoring better and similar to previous studies (Arbinaga Ibarzábal, 2013; Ponseti Verdaguier, García Más, Cantalops Ramón & Vidal Conti, 2017; Villarreal-Ángeles et al., 2017; Zarauz Sancho & Ruiz Juan, 2013). Athletes participating in team sports also showed lower anxiety scores similar to previous studies (Parnabas et al., 2015a, 2015b; Parnabas et al., 2015c; Parnabas et al., 2015d; Parnabas et al., 2015e) examining the effect of cognitive anxiety on the athletic performance of university players.

Self-esteem has been associated with the potential to develop sports skills (Can, 2014), and in the present study, we found conflicting results. Our results show that male and female athletes from both individual and team sports scored low on self-esteem, which contrasts with previous studies (Galante & Ward, 2017; Gustafsson et al., 2018). Also, body image was similar between all participants, which suggests that student-athletes rate themselves similarly. The findings of low self-esteem could be explained by the novelty of the subsystem of polytechnic universities in Mexico; therefore, students are not used to university competitions at the national level, which may influence their usual context (i.e., fans, facilities, traveling), which might impact their self-esteem. However, the results of the present study are similar to a previous finding in a similar sample of Mexican student-athletes (Villarreal-Ángeles et al., 2017).

In conclusion, during the national games most athletes showed low self-esteem and burnout risk. Females showed high self-esteem; however, males showed low anxiety, and in team sports, high depression scores and low anxiety and a good sports climate were observed. More evidence is needed as to determine burnout levels in different student-athletes in different Mexican states.

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