

Comparison of psychological constructs among mexican athletes participating in the National Inter-Polytechnic University Games, Durango, 2016

MARIO VILLARREAL-ÁNGELES¹, JESÚS GALLEGOS-SÁNCHEZ², YAMILETH CHACÓN-ARAYA³
AND JOSÉ MONCADA-JIMÉNEZ⁴

^{1,2}Physical Activity and Sports Faculty, Juárez University, Durango State, MÉXICO

^{3,4}Human Movement Sciences Research Center (CIMOBU), University of Costa Rica, COSTA RICA

^{3,4}School of Physical Education and Sports, University of Costa Rica, COSTA RICA

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Abstract:

The aim of this study was to compare selected psychological constructs of Mexican male and female athletes of individual and team sports who participated in the National Inter-Polytechnic Games in Durango, México, 2016. One hundred and ninety eight athletes completed a questionnaire about burnout syndrome, sports climate, depression, somatic anxiety, cognitive anxiety, and self-esteem. Results indicated a higher number of men in individual sports and women in team sports with less burnout risk ($\chi^2 = 16.71$, $p < 0.001$), but with low self-esteem ($\chi^2 = 20.76$, $p < 0.001$). No significant interactions were found between sports and gender variables for age, general burnout, sports climate, overall self-esteem, confidence, and body satisfaction ($p > 0.05$). Women had lower mean depression scores than men (45.34 ± 9.42 vs. 47.66 ± 7.64 , $p = 0.025$). Athletes in team sports had lower scores in somatic anxiety than individual sports athletes (13.83 ± 4.51 vs. 14.70 ± 4.94 , $p = 0.018$), and men had lower somatic anxiety scores than women (13.22 ± 4.29 vs. 14.76 ± 4.83 , $p = 0.002$). In conclusion, women showed higher cognitive anxiety scores than men and both showed similarities and differences in psychological constructs related to sports performance during the university sport competition.

Key words: burnout, sports climate, self-esteem, confidence, body satisfaction.

Introduction

Young university students participate in a wide variety of sports not only to represent the university but also as part of a personal life routine. A university athlete lives a double role: in first place, he/she is a student, and in second place, he/she is an athlete. In both roles, they have to develop the highest levels, which can be affected by stress conditions that should be detected in order to be controlled. Sports psychology and other sciences allow the understanding of these factors that affect sports performance positively or negatively (Fargier, Collet, Moran, & Massarelli, 2017). Based on academic literature, some of the factors that affect athletes before, during, and after competitions may be the burnout syndrome, the sports climate, self-esteem, anxiety and depression syndrome, which can cause behavioral disorders that may affect the mental and physical health of students (De Bruin, Oudejans, Bakker, & Woertman, 2011; Goltz, Stenzel, & Schneider, 2013; Varnes et al., 2013).

Based on this context, the burnout syndrome has been studied since the 70's in workplaces, and since the 80's, it has been analyzed in sports from different competitive levels (García-Parra, González, & Garcés de los Fayos, 2016). Maslach, Jackson, and Leiter (1997) affirm that the burnout syndrome is described as emotional tiredness, and lack of motivation and adaptation. For Schönfeld, Brailovskaia, Bieda, Zhang, and Margraf (2016), chronic stress that precedes the burnout syndrome is recognized as an important risk factor to suffer mental health impairment. According to Salinas, Rivera, and Rodríguez (2016), stress is an important clinic feature that elicits low levels of hormonal production due to a lack of sleep. This is associated with cardiovascular diseases, diabetes, cancer and low resistance to common illnesses affecting the general lifestyle.

In physical and sports education, this syndrome may occur when people show a generalized stress that disturbs labor and sports activity performance such as having no pleasure, satisfaction nor motivation, increasing the depression levels (Pinto Guedes & Gaspar, 2016). Many years can pass until a person develops the burnout syndrome, and sometimes it can be imperceptible to the athlete. Furthermore, this response is individual, accumulative and progress severely as a chronic response toward stress (Pinto Guedes & Gaspar, 2016). Cumulative evidence published throughout the years has suggested that the burnout syndrome affects athletes in different ways: physical and emotional tiredness, sensation of low achievement, and impaired sports performance (De Francisco, Garcés de Los Fayos, & Arce, 2015). On the contrary, Garcés De los Fayos Ruiz, Ortín Montero, and Carlin (2010), state the concern of the relationship between burnout syndrome and the sports performance.

Another factor to be considered about the success or failure of a sport is the climate that surrounds it. Research on this topic has considered some psychological elements associated with the athletes' motivation in their sports context, being the most important one the influence of the coaches (Jõesaar, Hein, & Hagger, 2012). Behavior training gives a feedback in task orientation and offers an intrinsic motivation. For this reason, this type of behavior is perceived as autonomous and inherently supportive a task climate, that is, task-oriented athletes are more likely to be conscious and resilient (Nordin-Bates, Quested, Walker, & Redding, 2012). In addition, Ntoumanis, Taylor, and Thøgersen-Ntoumani (2012), argued the partners' and coaches' behaviors have a great influence in the team sports' motivation and behaviors results promoting stability for the long term. Consequently, goal-oriented tasks relate to the personal priorities and independence of athletes.

An additional factor that may affect an athlete is self-esteem, considered as multi-functional. It consists in specific components of certain domains such as academic, social, and physical. This last one involves body satisfaction and sports competence (Haugen, Ommundsen, & Seiler, 2013). For Oteiza, Rodríguez, Carvajal, Carvajal, and Sepúlveda (2011), body satisfaction is formed with overall self-esteem strength, which shapes character, personality, and human behavior and can influence health and sports performance. Therefore, those who have an elevated self-esteem tend to have a healthier lifestyle (Pastor & Balaguer, 2001).

Presently, there is a bigger interest of studying different moods such as depression and sports activities. Gallego, Aguilar-Parra, Cangas, Rosado, and Länger (2016), observed the relationship between depression and popular and physical sports (e.g. yoga, tai-chi, and mindfulness) and they found that those who participated in these activities had a reduction in depressive symptoms. In all level of sports groups, it is necessary to demand the maximum mental and psychological effort from the athlete. Based on this premise, Olivares Tenza, López García, and Garcés de los Fayos (2016), reported a case study on a Spanish target shooter who suffered with depression which was reduced after an intervention in comparison to other mood states. It is known that mood modulates the intensity in other dimensions and affect sports performance (Andrade, España, & Rodríguez, 2016). According to Ferreira Brandão et al. (2015), it is important to study the relationship between psychological and physical conditions in athletes. Moya, Sarabia, and Torres-Luque (2016), affirm that moods vary in athletes based on their training load.

The environmental cognitive evaluation that athletes generates transitory emotional moods characterized by subjective tension and apprehension that are perceived consciously, and an increment of the autonomous system activity revealed by physiological clues as increments in heart rate, pupil dilation and perspiration known as anxiety (Arenas, Castellanos Loaiza, Aguirre-Loaiza, Trujillo, & Núñez Rojas, 2016). It is also known that sports competitiveness triggers anxiety due to it, which produces a behavior disposition in athletes that might provoke a situation perceived as menacing which can negatively affect the athlete's sports performance (Arenas et al., 2016).

Arenas Granada and Aguirre-Loaiza (2014), indicate that anxiety increases as competitive activity progress and that it can vary based on socio-demographic conditions and sports experience (Aguirre-Loaiza & Ramos Bermúdez, 2011). Aguirre-Loaiza and González-Gutiérrez (2014), claim that the combination of intrinsic and extrinsic motivational factors characterized the motivational profile of university athletes, which may be associated with different anxiety levels. In addition, it has been stated that anxiety varies based on sports modality and gender (Arias Padilla, Cardoso Quintero, Aguirre-Loaiza, & Arenas, 2016).

Finally, a psychological feature that has been studied in athletes is body image. Body image has been defined as the self-representation that a person has about his/her body (Chacón-Araya & Moncada-Jiménez, 2013). In general, it has been found that athletes who perform well have a better body image than those that are not athletes (Varnes et al., 2013). However, in a study where 156 male athletes participated (Goltz et al., 2013), it was found that approximately 25% had some degree of body dissatisfaction and, at the same time, this was related to eating disorders, a condition previously described in female athletes (Plateau, Arcelus, Leung, & Meyer, 2017).

In the aforementioned context and due to the importance of knowing the psychological factors that may affect the students' development, it was decided to describe the Mexican university athletes. Hence, the purpose of this study was to compare the psychological constructs of Mexican male and female athletes in individual and team sports that participated in the Inter-Polytechnic University National Games, Durango, 2016.

Material & methods

Participants

Volunteers from 14 different states of Mexico competed in the National Inter-Polytechnic University Games in Durango, Mexico, 2016. The sample was comprised of 198 male (n = 85) and female (n = 113) athletes.

Instruments and Measurement Procedures

With the consent of the Organizing Committee and the committee of coaches, every athlete received an explanation about the research in order to obtain their permission. Ethical principles were followed to guarantee the privacy and right of participating or not, following the international norms. Female and male athletes were

chosen randomly to represent both individual and team sports. These categories were created *a priori* to be statistically analyzed later.

Different instruments were used to measure the psychological constructs. The Burnout Measurement (BM) was used to identify the risk of suffering mental and physical fatigue (i.e., burnout). This test has 21 items based on seven scores of the Likert scale, from 1 (totally false) to 7 (for totally true). Once finished, every point is summed up to have the total and place the direct score in the scale from 1-4, 1 meaning less risk and 4 the most. This study used the Spanish version of Fernández-Castro, Doval, Edo, and Santiago (1994), with a logic validity and a very high internal consistency with an alpha coefficient of 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 really true. It has unifactorial validity based on confirmatory factor analysis (CFA) and good internal consistency, with an alpha coefficient of 0.96.

To measure self-esteem, the Rosenberg Scale was used (Rosenberg, 1965), with 0.76 and 0.87 validity and 0.80 reliability (Rodríguez 2006). This scale estimates how people value themselves. It has 10 questions, answers varying from 1 totally agree, 2, agree, 3, disagree and 4, very totally disagree. This scale allows to having a minimum of 10 and a maximum of 40. If the participants get 0-25 points, self-esteem is considered low. From 26-29, normal, and from 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, Rasmussen, Olsen, Noerholm, & Abildgaard, 2001; Bech et al., 1997). The Competitive State of Anxiety Inventory (CSAI-2) (Cox, Martens, & Russell, 2003). This is a multi-dimensional inventory and it is based on 17 items with their corresponding somatic anxiety scale (AS), cognitive anxiety (CA) scale and self-esteem (SE). Answers are given in a Likert scale from 1-4, where 1-nothing, 2-a little, 3-moderate, and 4-sufficient. To obtain the total score, items should be 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 (AS $\alpha = 0.80$, CA $\alpha = 0.83$ and SE $\alpha = 0.79$), and a high reliability through exploratory and CFA (Andrade Fernández, Lois Río, & Arce Fernández, 2007). Finally, the Body Image Assessment Scale was used (Thompson & Gray, 1995), which has 9 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 a 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". Difference between the present score and the desirable score is considered as body satisfaction or body dissatisfaction.

Statistical Analysis

IBM-SPSS Statistics, version 20 was used for statistical analysis. Descriptive statistics included the mean (M) and standard deviation (\pm SD). Chi² test was used in non-parametric statistics to cross the categorical variables of sex, sports category, standardized burnout, and standardized self-esteem.

Parametric analysis included two-way analysis of variance (ANOVA) (sports by gender) for the burnout dependent variables, sports climate, and self-esteem, depression, AS, CA, SE, and body satisfaction. Statistical significance was established *a priori* at $p \leq 0.05$.

Results

One hundred and ninety eight male and female athletes that participated in the National Inter-Polytechnic University Games in Durango (Mexico) were included in the sample. Sports represented were Karate-Do (n = 21), basketball (n = 57), volleyball (n = 74), and Taekwondo (n = 67) grouped into individual sports (i.e., Karate-Do and Taekwondo, n = 67) and team sports (i.e., basketball and volleyball, n = 131). The characteristics of participants are described in table 1.

Table 1. Descriptive Statistics of the Athletes under Study. Values show the mean \pm SD by gender.

Variable	Women (n = 113)	Men (n = 85)
Age (years)	20.22 \pm 2.55	20.28 \pm 1.65
Burnout (pts.)	43.79 \pm 14.98	43.61 \pm 13.69
Sport Climate (pts.)	82.90 \pm 18.78	87.26 \pm 16.32
Self-esteem (pts.)	22.85 \pm 3.54	22.07 \pm 4.09
Depression (pts.)	45.34 \pm 9.42	47.66 \pm 7.64
Somatic anxiety (pts.)	14.76 \pm 4.83	13.22 \pm 4.29
Cognitive anxiety (pts.)	11.73 \pm 4.00	10.45 \pm 3.69
Confidence (pts.)	13.73 \pm 3.79	14.40 \pm 3.81
Body satisfaction (Δ)	0.65 \pm 1.76	0.00 \pm 0.90

Standardized burnout measure for females gave lower risk levels (65.5%), low risk (25.7%), in risk (7.1%) and two athletes classified with burnout (1.8%). In males, less risk was 52.9%, low risk 36.5%, in risk 9.4% and only one classified with burnout (1.2%). An association between sport and gender of participants was found in burnout ($\chi^2 = 16.71$, $p < 0.001$), where more males are in individual sports and females in team sports with less risk of burnout.

Based on the Rosenberg Scale, female's self-esteem was low (80.6%), normal (17.6%), and high (1.9%). In males, self-esteem was low (91.4%), normal (7.4%), and high (1.2%). An association between sport and gender of participants was found in self-esteem ($\chi^2 = 20.76$, $p < 0.001$), in which more males are in individual sports and females in team sports with low self-esteem.

Inferential statistic by the ANOVA did not reveal significant interactions or main statistical effects between sport and gender for age, general burnout, sports climate, general self-esteem, confidence, and body image (Table 2). A significant gender difference was found in depression ($p = 0.025$), in which females had average rates lower than men (45.34 ± 9.42 vs. 47.66 ± 7.64). For somatic anxiety, although no significant interaction was found between sports and gender ($p = 0.267$), significant main effects were found in the sports type ($p = 0.018$) and gender ($p = 0.002$). For that reason, collective sports athletes had lower scores (13.83 ± 4.51) than individual athletes (14.70 ± 4.94), and males had lower scores (13.22 ± 4.29) than females (14.76 ± 4.83). In cognitive anxiety, females had higher scores than males (11.73 ± 4.00 vs. 10.45 ± 3.69 , $p = 0.048$) (Table 2).

Table 2. Inferential Statistics of ANOVA for the dependent variables per sport and gender categories.

Variables	ANOVA, $p \leq$						
	Individual Sports (n = 67)		Collective Sports (n = 131)		A	B	A x B
	Women (n = 24)	Men (n = 43)	Women (n = 89)	Men (n = 42)			
Age (yrs.)	20.29 ± 1.94	20.16 ± 1.51	20.20 ± 2.70	20.40 ± 1.78	0.828	0.916	0.637
Burnout (pts.)	47.12 ± 17.26	41.77 ± 12.88	42.89 ± 14.26	45.50 ± 14.39	0.912	0.547	0.082
Sport climate (pts.)	87.35 ± 19.67	86.79 ± 17.36	81.72 ± 18.47	87.77 ± 15.33	0.420	0.341	0.252
Self-esteem (pts.)	22.50 ± 4.61	22.33 ± 3.15	22.93 ± 3.28	21.79 ± 4.97	0.934	0.299	0.445
Depression (pts.)	42.42 ± 13.88	48.35 ± 7.05	45.99 ± 8.08	46.79 ± 8.34	0.499	0.025	0.086
Somatic anxiety (pts.)	17.00 ± 5.19	13.67 ± 4.52	14.27 ± 4.64	12.68 ± 3.98	0.018	0.002	0.267
Cognitive anxiety (pts.)	11.95 ± 4.70	10.10 ± 3.40	11.68 ± 3.86	10.89 ± 4.01	0.695	0.048	0.425
Confidence (pts.)	13.00 ± 4.18	14.33 ± 3.73	13.89 ± 3.71	14.49 ± 3.96	0.425	0.139	0.572
Body satisfaction Δ	0.15 ± 2.32	- 0.08 ± 0.96	0.77 ± 1.59	0.09 ± 0.84	0.120	0.074	0.372

Note: ANOVA: Analysis of variance test; a: sport by category; b: gender; a x b: interaction between sport and gender categories; $p \leq$ statistical significance.

Discussion

In this study psychological constructs were analyzed, those that may influence sports performance of university athletes. In relation to the depression variable, some authors claim that it may be a consequence of burnout (De Francisco, Arce, del Pilar Vilchez, & Vales, 2016; Dubuc-Charbonneau & Durand-Bush, 2015). Grobbelaar, Malan, Steyn, and Ellis (2011), suggest that a clear relationship between the different burnout subscales and depression may exist. In this study, a low number of athletes with burnout symptoms were found, which revealed low levels of depression for both females and males in individual and/or team sports.

The burnout results found in this research were different from the one by Choco Vargas (2015), who reported that 10% of athletes had no burnout, 40 % had a low burnout, 35% average burnout, and 10% high burnout. Gustafsson, Kenttä, Hassmén, and Lundqvist (2007), mentioned that the burnout seemed to be more frequent in individual athletes in contrast to those who compete in team sports. In their study, the difference between genders looked almost the same as what the ones found in this research, due to females having lower scores for each level and not only for team sports. Gustafsson et al. (2007), indicated that the majority of athletes experimented low to moderate burnout levels, even though some of them reported high levels when comparing individual and team sports. For this variable, it is evident in this research that females had higher levels of burnout in individual sports than males, who may have a higher risk of burnout when participating in team sports.

In the present study, it was observed that males perceived a better atmosphere in collective sports in contrast to females, who perceived a better atmosphere in individual sports. Almagro, Sáenz-López, González-Cutre, and Moreno-Murcia (2011), studied the prediction of the motivational climate in athletes, the basic psychological needs, and the intrinsic motivation related to sports practice adherence. A sample of 580 athletes with an average age of 14.5 answered questionnaires. They found that the motivational climate of doing a task predicted the three basic psychological needs and the intention of being physically active. Those findings are similar to what we found: males had a better perception of the motivational climate in collective sports and females in individual sports. The motivational climate implies that the ego predicts the need to be autonomous and competitive. Individual sports in males and collective sports in females, indicate a factor that can affect the

motivational climate and the orientation toward results as discussed in Troncoso Avalos, Burgos Dávila, and López-Walle (2015). In a sample of 31 university athletes, interactions between coach-athlete were studied to understand leadership, motivational climate, and communication between sports leaders and athletes. Researchers found that coaches who generate a motivational climate more oriented to ego than to the task, is linked to the task orientation in athletes focused on the results, perceiving more competence toward their partners. Furthermore, they conclude that when an athlete trusts in the coach, they have more sports satisfaction. Thus, the coach that enhances a social environment, facilitates athletes to enter into competition with the teammates and focus their attention on winning. That could happen in the present study where males perceived more competence in individual sports and females perceived more competence in collective sports.

We found that self-esteem was directly related to task due to the theory of auto-determination that claims that the most autonomous types of motivational regulation will show higher levels of positive functionality and personal adjustment (Deci & Ryan, 2000). López Walle, Balaguer Solá, Castillo Fernández, and Tristán Rodríguez (2011), found a relationship between the motivational regulations and self-esteem, which indicates that being self-motivated is associated with desirable consequences like having adequate self-esteem. We found a relationship between good self-esteem and sports climate.

For anxiety variables, the results found are similar to the ones of Jaenes Sánchez, Peñaloza Gómez, Navarrete Dueñas, and Bohórquez Gómez-Millán (2012), who studied the pre-competitive anxiety in athletes. That study measured the cognitive anxiety, somatic and self-confidence in a sample of 156 competitors. What they found was the majority of them had low cognitive and somatic anxiety. Ruiz-Juan, Zarauz Sancho, and Flores-Allende (2015), reported similar results to the ones we found, due to females having higher cognitive and somatic values compared to males, while auto-confidence in males was higher. León Prados, Fuentes García, and Calvo Lluch (2011), found that women had higher somatic and cognitive anxiety in contrast to males, who presented higher levels of self-confidence. Finally, in relation to body satisfaction, the results confirmed what previous research found in relation to a lower level of body image in males and females who compete in individual and team sports.

Conclusions

In conclusion, for the majority of participants the burnout risk is low, which could indicate that sports promotes better mental health in the University Mexican university students. However, self-esteem scores were very low in both genders, which requires further research.

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