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Psychological strain among Spanish amateur athletes a cross-sectional study

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This study aims to contribute to the existing body of research by providing data on the prevalence of psychological strain in a sample of amateur sports. Psychological strain was assessed in 359 Spanish amateur athletes using the APSQ. The mean APSQ score was 19.6±5.2, comparable to scores reported in elite athlete. Overall, 47.6% of participants reported high stress levels, and 23.1% reported very high stress. High distress was more frequent in women, while very high distress was more prevalent in men. Athletes involved in team sports reported higher levels of distress than those in individual sports. Very high stress was significantly more common among athletes who had sustained recent sports injuries. A linear regression analysis identified younger age and recent injury as significant predictors of psychological strain. These findings underscore the high prevalence of psychological strain among amateur athletes, with younger age and recent injuries emerging as key contributing factors.

KEY WORDS: Amateur; Athletes; Psychological Strain; Sports injury; Mental Health

Introduction

Psychological strain can be considered as a combination of perceived stress and difficulty coping that arises in response to a stressful experience when sufficient resources to manage it are unavailable (Rice, Parker et al.,

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2020). Psychological strain is a powerful predictor of maladaptive behaviors and mental health issues. The absence of effective coping mechanisms, coupled with negative experiences or stressors, is often cited as a key factor driving individuals toward behaviors such as crime, delinquency, drug use (Hoffmann & Su, 1997), or suicide (Zhang et al., 2013). Consequently, psychological strain has been the target of numerous researches performed in the field of criminal, clinical or social psychology.

In recent years, mental health problems among athletes have received increasing attention due to their notable prevalence. Studies report that conditions with a strong negative impact on mental health – such as anxiety and depression – may affect up to 34% of athletes (Gouttebarge et al., 2019). This high prevalence underscores the need for earlier identification and recognition of mental health symptoms within this population (Gouttebarge et al., 2021). In this scenario, the study of psychological strain has garnered increasing interest among sport psychologists, who have emphasized the importance of identifying its prevalence among elite athletes (Rice, Parker et al., 2020).

Psychological strain in this population may stem from exposure to sport-specific stressors – such as susceptibility to injury, performance setbacks, or pressure from popular and social media – which can jeopardize athletes' mental health when they struggle to cope effectively with these challenges (Rice, Olive et al., 2020).

Although studies on the mental health of sport practitioners have been mainly conducted on elite athletes, there is a growing recognition of the need to extend research to recreational and amateur practitioners, who currently lack clear guidelines and recommendations for mental health care (Lima & Rice, 2022; Vella et al., 2021). In this regard, scientific evidence has lent force to the idea that stress levels and psychological strain may not differ significantly based on the intensity or level of sports participation. For instance, a meta-analysis by Gorczynski et al. (2017) found that high-performance athletes were no more likely than non-athletes to experience mild or severe depressive symptoms. Similarly, a meta-analysis by Rice et al. (2019) on anxiety determinants in elite athletes revealed that their anxiety levels were comparable to those of non-athletes, concluding that the factors influencing anxiety and depression in elite athletes largely reflect those affecting the general population. In addition, existing studies have shown that amateur athletes can experience similar mental health challenges – such as anxiety, depression, and psychological distress – comparable to those faced by elite athletes (Foskett & Longstaff, 2018; Walton et al., 2020). In line with this evidence, both competitive athletes and amateur sport practitioners have

reported increased psychological strain associated with reduced training opportunities during the COVID-19 pandemic (Azadi et al., 2024).

In spite of all this, amateur athletes have been largely overlooked in mental health research, with relatively few studies examining the prevalence of psychological strain within this population (Shannon et al., 2024). Under these circumstances, the present study aims to contribute to the existing body of scientific evidence by providing data on the prevalence of psychological strain among a sample of amateur sports practitioners.

Methods

Sociodemographic and Sporting Practice Characteristics

This cross-sectional investigation recruited individuals mainly through social media, with additional outreach efforts targeting sports clubs and organizations across various regions of Spain via email. Participants were asked to provide details about their age, the sport modality they practice, their motivation for engaging in sports, and the presence of any sports-related injuries during the last week. Sport modality was categorized as individual or team sports, with team sports referring to disciplines contested between opposing teams and individual sports involving athletes competing on their own (Rooney et al., 2021).

Eligible participants were required to be between 18 and 65 years old and to have competed in at least one federation-organized regional event during the 2023/2024 season. Individuals who had competed at the national or international level or lacked a federation license to practice sports were excluded from the study. Before taking part in the study, all participants were informed about its objectives and requirements and provided their informed consent. The study was approved by the Ethics Committee of the Faculty of Education and Sports Science, University of Vigo. Out of the 418 participants initially recruited, 359 (mean age: 31 years (SD 9); 67.1% men) provided valid data for further analysis.

Measurements

Psychological Strain

Psychological strain was assessed using the Athlete Psychological Strain Questionnaire (APSQ), a tool specifically developed by Rice, Parker et al. (2020) or use among elite athletes. The APSQ consists of 10 items rated on a 5-point Likert scale, ranging from 1 (none of the time) to 5 (all of the time), based on a 30-day recall period. It is designed to assess self-regulation difficulties, performance concerns, and external coping strategies across three dimensions: Self-Control Difficulties (items 1-4), Performance Anxiety (items 5-8), and External Coping (items 9-10). The total score is obtained by summing responses across all 10 items, resulting in a possible range of 10 to 50. Scores below 15 indicate no stress, 15–16 moderate stress, 17-19 high stress, and 20+ very high stress. The APSQ has been validated as a screening tool for assessing psychological strain in non-elite amateur athletes (Shannon et al., 2024). For this study, the Spanish validated version of the APSQ was used (García-Rubio et al., 2025).

Procedures

For data collection, participants were invited to complete an online survey, which remained active for the whole sports season. They had the flexibility to fill out the survey at their convenience, using either a computer or a mobile device. To ensure privacy, all responses were recorded anonymously, with no identifying information collected.

Statistical Analysis

Quantitative variables were represented as mean (standard deviation) if they had a normal distribution using the Kolmogorov-Smirnov test, or median (interquartile range) if not, and qualitative variables as n (%). The values of the APSQ were categorised into four categories, as outlined above. Contingency tables were calculated to detect associations with the basal variables (sex, type of sport or injury) using the Chi-square test. Standardized adjusted residuals were then used to identify cells that were statistically different. Furthermore, a multiple regression analysis was performed to ascertain the predictive value of the basal variables, including age, for the APSQ. Statistical significance was indicated by a two-tailed p-value of less than 0.05. All analyses were conducted using the SPSS software (IBM Corp., Armonk, N.Y., USA).

Results

Participation in individual and team sports was relatively balanced (45.1% vs. 54.9%, respectively), with the primary motivation for engaging in sports being recreation and leisure (58.8%), followed by performance improvement (20.9%) and health benefits (10.9%). Additionally, 63 out of the 359 participants reported experiencing a sports injury in the past week. Neither sex nor sport performance frequency significantly influenced injury incidence. However, sports injuries were more frequently reported among team sport athletes than individual athletes (23.4% vs. 10.5%; p=0.001).

The total APSQ score for the entire sample was 19.6 (SD 5.2) (Table 1). Overall, 47.6% of participants exhibited high stress levels, while 23.1% reported very high stress levels. Additionally, 11.4% experienced moderate stress, and 17.8% showed no signs of distress.

Figure 1 illustrates the percentage distribution of stress levels based on sex, sport modality, and sport injury. High distress levels were more common among women than men (26.4% vs. 22.2%), whereas very high distress levels were more prevalent among men (48.5% vs. 42.1%). Additionally, high and very high distress levels were more frequently observed in team sports practitioners compared to individual sports participants (24.3% vs. 21.6% and 49.2% vs. 45.6%, respectively). No significant differences were

TABLE 1: *Descriptive Values of the APSQ.*

Descriptive APSQ (n=359)	Mean	SD	Median	P25	P75
APSQ-1	1.77	0.90	2	1	2
APSQ-2	2.23	0.83	2	2	3
APSQ-3	2.36	0.84	2	2	3
APSQ-4	1.94	0.89	2	1	3
APSQ-5	2.42	1.18	2	1	3
APSQ-6	1.95	0.98	2	1	2
APSQ-7	1.60	0.88	1	1	2
APSQ-8	2.80	1.39	3	2	4
APSQ-9	1.18	0.53	1	1	1
APSQ-10	1.36	0.71	1	1	2
APSQ - Self regulation difficulties	8.30	2.45	8	7	10
APSQ - Performance concerns	8.77	3.03	9	6	11
APSQ - Externalised coping	2.54	1.01	2	2	3
APSQ - TOTAL	19.61	5.16	19	16	23

P25 = 25th percentile; P75 = 75th percentile.

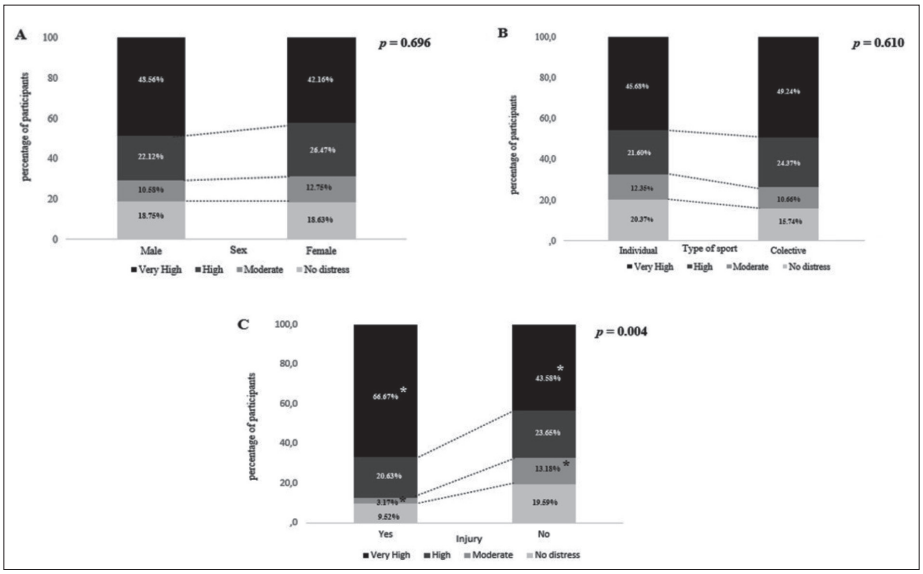

Figure 1. Participants with psychological strain levels according to sex (A), sport modality (B) and sport injury (C). *denote significance at z-value ≤ - 2; ≥ 2.

observed regarding sex or sport modality regarding distress levels. Notably, very high stress levels were more prevalent among those who had sustained a sports injury (66.6% vs. 43.5%) (p=0.004).

Results obtained in the APSQ taking into account sport modality, sex and sport injury are shown in Table 2. Significant differences were found between individual and team athletes in the "Performance Concerns" dimension (p= 0.008). Having suffering a sport injury was the only variable that had a significant impact on the APSQ total score. The linear regression model indicated that being younger (beta = -0.219; b= -2,988 [-4,443; -1,532]; FIV=1.023) and having suffering an injury (b = -0.221; b= -0,127 [-0,190; -0,065]; FIV=1.023) were significant factors associated for developing psychological strain (R= 0.334; R2 = 0.111; p<0.001; F=19.037).

Discussion

This research provides insight into the potential presence of psychological strain among a sample of amateur sports practitioners. The findings may be valuable for professionals in sports and exercise psychology and contribute to expanding the existing body of scientific evidence on this topic.

TABLE 2: *Differences On Psychological Stress According To Sex, Sport Modality And Sport* injury.

Sex	**Male**		**Female**		***p* (t-Student)**
	Mean	**SD**	**Mean**	**SD**	**P75**
APSQ - Self regulation difficulties	8.2	2.4	8.4	2.5	0.438
APSQ - Performance concerns	8.7	3.0	8.7	3.2	0.894
APSQ - Externalised coping	2.6	1,0	2.4	1.1	0.184
APSQ - TOTAL	19.5	5.1	19.5	5.3	0.982
Type of sport	Individual		Team sports		p (t-Student)
APSQ - Self regulation difficulties	8.4	2.6	8.2	2.4	0.360
APSQ - Performance concerns	8.3	2.9	9.2	3.1	0.008
APSQ - Externalised coping	2.6	1.0	2.5	1.0	0.600
APSQ - TOTAL	19.3	5.2	19.9	5.1	0.312
Injury	Yes		No		p (t-Student)
APSQ - Self regulation difficulties	8.8	2.7	8.2	2.4	0.051
APSQ - Performance concerns	10.6	3.1	8.4	2.9	0.000
APSQ - Externalised coping	2.8	1.2	2.5	1.0	0.021
APSQ - TOTAL	22.3	5.6	19.0	4.9	0.000

A somewhat unexpected finding is the elevated levels of psychological strain observed among amateur athletes. In fact, the mean APSQ score in our sample was comparable to that reported among Japanese professional rugby players (n=219; 19.1) (Ojio et al., 2021) and slightly higher than those observed in elite athletes from Turkey (n=370; 18.9) (Lima et al., 2022), Croatia (n=869; 18.5) (Sore et al., 2024), and China (n=501; 18.2) (Gao & Wang, 2024). Moreover, it was considerably higher than the score reported by Rice, Olive et al. (2020) among Australian elite athletes (n=1,007; 14.1). Notably, when the APSQ was administered to mixed-level athlete samples, similar scores were found, as demonstrated by studies on Arabic (n=92; 19.2) (Alhowimel et al., 2023) and Spanish (n=128; 19.9) (García-Rubio et al., 2025) sports practitioners.

The high prevalence of distress observed among survey respondents aligns with Shannon et al. (2024), who reported a mean APSQ score of 22.1. In their study of 605 amateur sports practitioners, 75.9% met the criteria for further psychological screening due to potential high psychological strain-closely matching the 71% identified in the present research. The presence of mental health problems among amateur sports practitioners has also been highlighted in previous research. For instance, Lima & Rice (2022) administered the APSQ to a sample of 1,263 amateur football players and found that approximately 17% exhibited high distress levels, while 45% reported very high distress levels. In this line, Walton et al. (2020) reported no significant differences in psychological distress between recreational and competitive athletes. Similarly, Turner et al. (2019) found no meaningful differences in psychological distress levels when comparing elite athletes, sports participants, and non-sports participants, suggesting that competitive level alone may not be a decisive factor in psychological strain. Finally, Foskett & Longstaff (2018) found that 43% of amateur national-level athletes exhibited signs of anxiety or depression. However, it is worth noting that only 14% of the sample explicitly reported experiencing psychological distress.

The presence of psychological strain among amateur athletes may stem from the unique combination of stressors they face while balancing life demands (e.g., work and family) alongside their sport commitments (Rose et al., 2023). Unlike elite athletes, who often have access to resources such as coaches and sports psychologists for psychological support, amateur athletes may struggle to cope with these stressors effectively.

This research provided insight into whether sex, sport type, age, and sports injuries influence psychological strain. Previous studies have consistently shown that female athletes experience higher levels of psychological distress

compared to their male counterparts (Foskett & Longstaff, 2018; Gulliver et al., 2015; Turner et al., 2019). However, findings regarding psychological strain measured by the APSQ remain mixed. On one hand, Mountjoy et al. (2023) found that female university student-athletes scored significantly higher than males, a pattern also observed by Waleriańczyk et al. (2024) among Olympic athletes. Similarly, Anderson et al. (2023), reported consistently higher APSQ scores among female Olympic athletes. On the other hand, Lambert et al. (2022) and Lima et al. (2022) found no significant sex-based differences in APSQ scores when comparing male and female elite and Olympic athletes. Regarding amateur sports practitioners, Shannon et al. (2024) found that sex was not a significant factor for psychological strain, aligning with our findings.

Studies have highlighted notable distinctions in psychological skills and athletic performance between athletes in individual and team sport (Kajbaf et al., 2011; Teh & Krishnan-Vasanthi, 2022). Research suggests that team sports are more closely linked to positive psychological benefits (Eather et al., 2023; Pluhar et al., 2019), whereas individual athletes may face higher mental health risks. This is often due to increased self-blame following setbacks and a lack of the social support and camaraderie found in team environments (Reardon et al., 2024). In this study, we observed significant differences indicating that athletes in team sports reported higher performance concerns compared to those in individual sports, consistent with findings by Lambert et al. (2022). However, no other significant differences were noted, suggesting that among amateur athletes, sport modality did not have a substantial impact on overall psychological strain, as also reported by Shannon et al. (2024).

Regarding age and sport injury, the regression analysis clearly showed a significant influence of both factors in psychological strain, which is in accordance with the existing scientific evidence. Research indicates that young athletes encounter distinct stressors that may increase their vulnerability to mental health challenges (Xanthopoulos et al., 2020). Conversely, older athletes tend to develop greater independence in managing these pressures, allowing for more effective coping strategies (Henriksen et al., 2019). In this regard, Vaughan et al. (2020) found that elite athletes with less expertise experienced greater stress after completing the APSQ. Similarly, there is a well-established link between sports injuries and mental health issues among athletes (Haugen et al., 2022). The negative consequences of sports injuries – such as pain, reduced well-being, and diminished athletic performance – can elevate stress levels. Li et al. (2019), contributing to greater psychological strain, as observed in this study.

This research provides interest insights into the presence of psychological strain among amateur athletes, contributing to the limited studies conducted in this field so far. The results support the notion that the APSQ can serve as an initial screening tool for psychological strain among amateur athletes but should not be used as a standalone diagnostic instrument. However, the findings should be interpreted with the following limitations in mind. First, the participants were Spanish amateur athletes who voluntarily chose to take part in the study, which may limit the representativeness of the sample. Second, several sociodemographic and socioeconomic variables, which are potential confounding factors in assessing psychological strain, were not considered. As a result, the findings should be interpreted with caution, as they may not fully capture the complexity of psychological strain. Lastly, comparisons based on age, sex, and sport type were somewhat constrained due to the small sample size.

Conclusion

Signs of psychological strain are commonly observed among both individual and team amateur athletes, regardless of sex. Younger age and a history of sports injury were identified as risk factors that increase the likelihood of experiencing psychological strain. Further well-powered studies that account for potential confounding variables are necessary to confirm these findings.

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