

# Bibliometric Analysis of Anxiety and Athlete in the Last Decade

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**Abstract** This article provides an empirical review of anxiety concerning athletes around the world. To identify and measure the determinants of anxiety disorders experienced by athletes based on the level of competition, type of sport (team or individual) and gender. The type of research is bibliometric analysis, to explore and analyze amounts of scientific data about anxiety and athletes. The extracted articles were Scopus-indexed articles stored in publish or perish software between 2012-2022, totaling 196 articles that matched the keywords. Moreover, the VOSviewer software was used to explore and analyze data. The results of the bibliometric analysis of these articles highlight the exponential increase in anxiety in athletes in scientific production in the last decade, with the thematic and temporal separation of the concepts studied. This article summarizes the author's interest in relevant topics, about anxiety and athletes in the last 10 years by looking at the highest levels of scientific production and the most citations in the big blocks: (1) athlete anxiety in sports; (2) athlete depression in sports; and (3) athlete competition anxiety. This article spanning a decade provided evidence for evolution and paved the way for researchers seeking alternative visions of the relationship between athlete anxiety, depression and competition. The determinants of anxiety in athletes broadly reflect differences in anxiety based on type of sports, competitive level and experience, and gender.

**Keywords** Bibliometric, Anxiety, Athletes, One-Decade

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## 1. Introduction

Through bibliometric analysis, this article aims to analyze the scientific interest and evolution of the effects of anxiety on athletes. To get achievements as a professional athlete requires hard work from start to finish, such as training preparation, physical condition preparation and mental preparation. Sports achievement does not only depend on the sports technical skills and physical health possessed by the athlete in question but also depends on psychological conditions and mental health. Often when facing competition, athletes experience uncontrolled anxiety [1].

Anxiety is a condition of changes in mood by negative factors and symptoms of physical tension [2]. Anxiety as a feeling can be obtained by someone after evaluating and assessing how to handle a situation [3]. In the world of sports, conflicts and competition between participants are very natural, and there are so many athletes who don't have a strong and good mentality when they are competing [4]. Even though athletes are world champions, anxiety is a natural thing, what distinguishes good and bad mentality is how an athlete is able to control anxiety [5].

Athletes with high levels of cognitive anxiety and high cortisol concentrations may indicate better psychophysiology [4]. Social physical anxiety negatively

impacts the mental health of athletes through two distinct mechanisms, decreased perceived satisfaction of basic psychological needs and increased psychological inflexibility [6]. Competitive anxiety can be measured by its intensity (low or high), frequency (always or never), and perceived direction (positive or negative) [7]. Anxiety disorders are characterized by emotional responses associated with fear, worry, and tension in response to real or perceived threats [3]. Someone who has anxiety within himself means that he has the thought that he does not have the ability to meet the demands of physical and technical abilities according to the tasks required in the sport. Anxiety for an athlete is a natural and humane psychological condition, but if it is excessive and the athlete is unable to control himself, of course it will have a negative impact on the athlete [8].

Therefore, the preparation of athletes to participate in sports events must be given a special program to train the mentality of competing, winning mentality and losing mentality of athletes [9] and must be accompanied by a psychologist or mental coach, so that the implementation of the training can increase maximum results in all aspects of supporting achievement [8].

Thus, the temporal evolution of anxiety studies in relation to sport necessitates extensive and updated meta-analytic studies that provide a visionary view for the scientific community, namely through a bibliometric approach that analyzes data and metadata from pre-existing specialized articles.

## 2. Materials and Methods

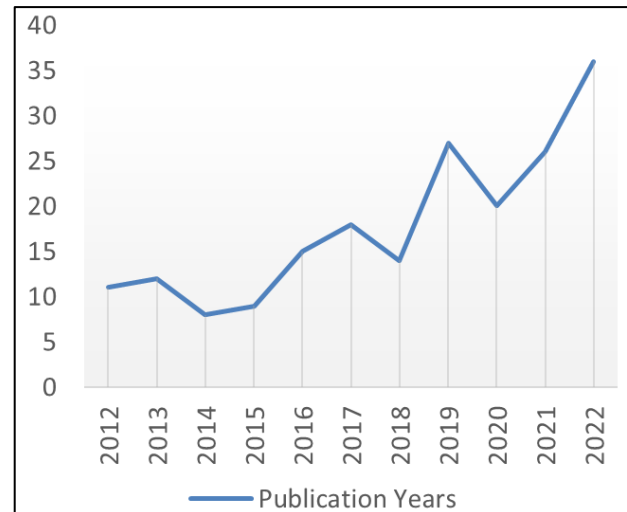
This study uses descriptive quantitative analysis. The resulting collection of articles or journals is analyzed using a bibliometric, meta-analytic method [10]. Bibliometrics is increasingly being used as a viable and sufficiently objective methodology resulting from large-scale standardized data for evaluating research results [11].

This study uses articles or scientific journals as a homogeneous database using publish or perish software, selecting articles published in journals indexed by Scopus database. Based on search results about anxiety and athlete with the time parameter 2012-2022 by filling in "anxiety" in the title words, and "athlete" in the keywords. Furthermore, information processing and visualization of spatiality, co-authorship, and co-occurrence were processed with VOSviewer software, using fragmentation analysis with thematic and time trend visualization outputs [3].

## 3. Result and Discussion

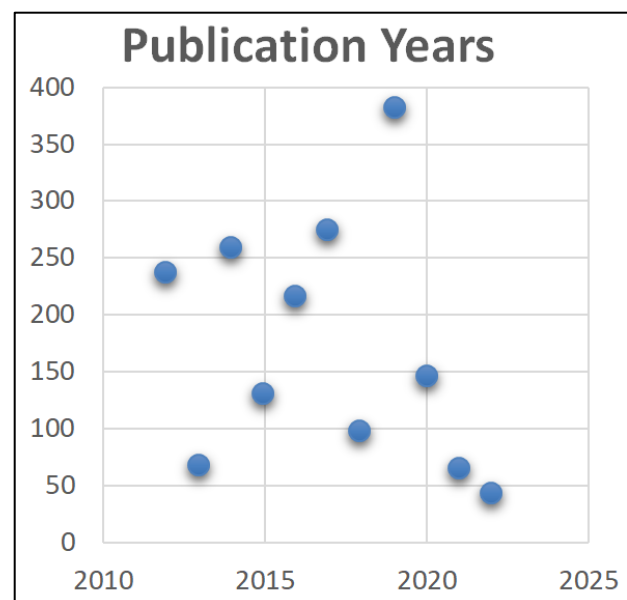
The results obtained from anxiety and athlete used publish or perish software on the Scopus database from 2012-2022 showed that there are 197 article publications

according to keywords written with type filter using the article. The meta-analytic results have been analyzed from different perspectives: keywords, country of origin of articles, most influential authors, evolution of number of published articles and citation trends.



**Figure 1.** Trend of publications on anxiety and athlete (2012-2022)

Figure 1 describes the number of articles about anxiety and athletes published from 2012-2022. Figure 2 describes the temporary evolution of the keywords representing the temporal evolution of the 3 prominent keywords with 43 occurrence thresholds out of a total of 487 keywords. It was emphasized that, in 2012, research was conducted on the concept of anxiety in athletes.

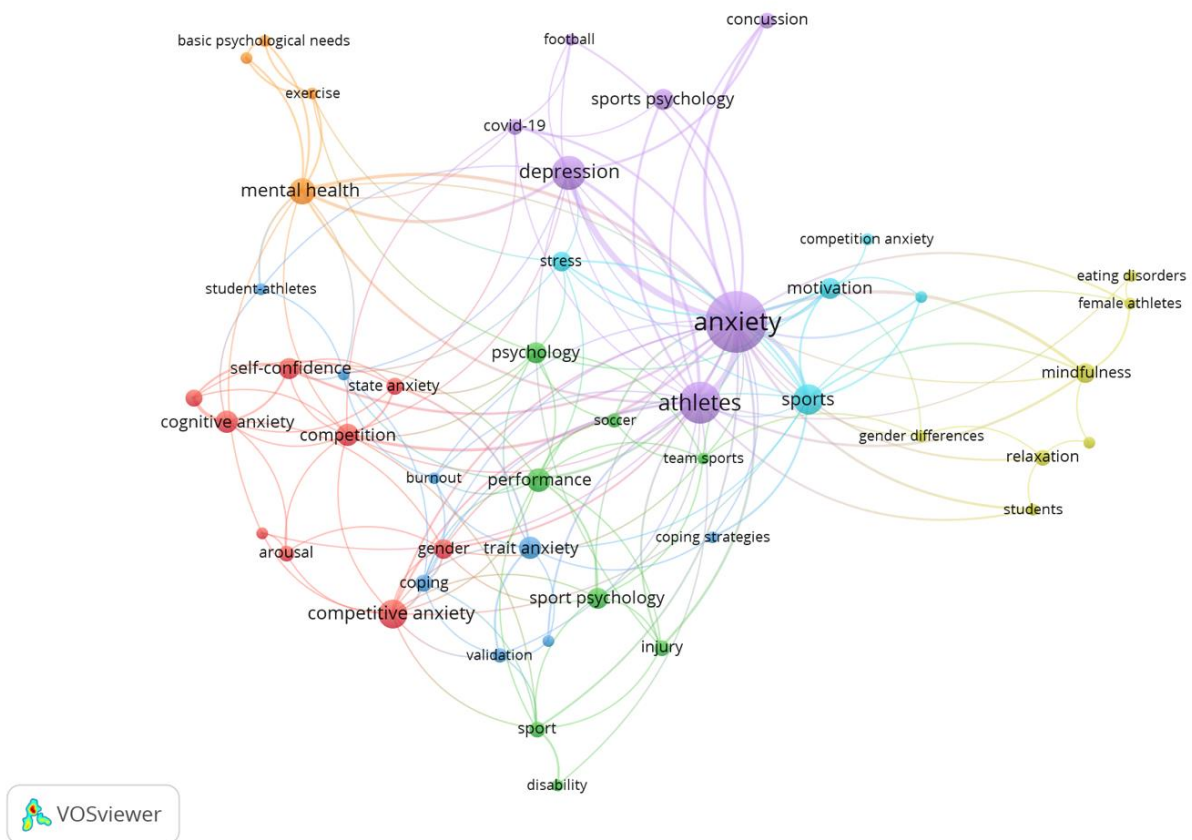


**Figure 2.** Citations in 2012-2022

Figure 2 describes the number of citations in anxiety and athlete articles in the period 2012-2022.

**Table 1.** Articles with the most citations

Year	Title and author	Citations
2019	Determinants of anxiety in elite athletes: a systematic review and meta-analysis [12].	89
2019	Team sport athletes may be less likely to suffer anxiety or depression than individual sport athletes [13].	73
2012	Sleepy quality evaluation, chronotype, sleepiness, and anxiety of paralympic Brazilian athletes: Beijing 2008 Paralympic Games [14].	71
2014	Postinjury anxiety and social support among collegiate athletes: a comparison between orthopaedic injuries and concussions [15].	67
2014	Relations of Parent- and Coach-Initiated Motivational Climates to Young Athletes' Self-Esteem, Performance anxiety, and autonomous motivation: who is more influential? [16].	65
2014	Heart rate variability and pre-competitive anxiety in BMX discipline [17].	54
2016	Sleep, anxiety, and electronic device use by athletes in training and competition environments [18].	45
2015	A study on the relationship between compulsive exercise, depression and anxiety [19].	44
2017	Preseason anxiety and depressive symptoms and prospective injury risk in collegiate athletes [20].	43
2015	Anxiety in the youth physical and sport activity [21].	42



**Figure 3.** Network visualization

**3.1. Anxiety and Athlete Publication Development Map Based on Keywords (Co-Occurrence)**

Figure 3 shows a network visualization of co-occurrence which explains the network or relationship between one term and another in research in the field of anxiety and athlete in the period 2012 – 2022. Based on the 196 articles

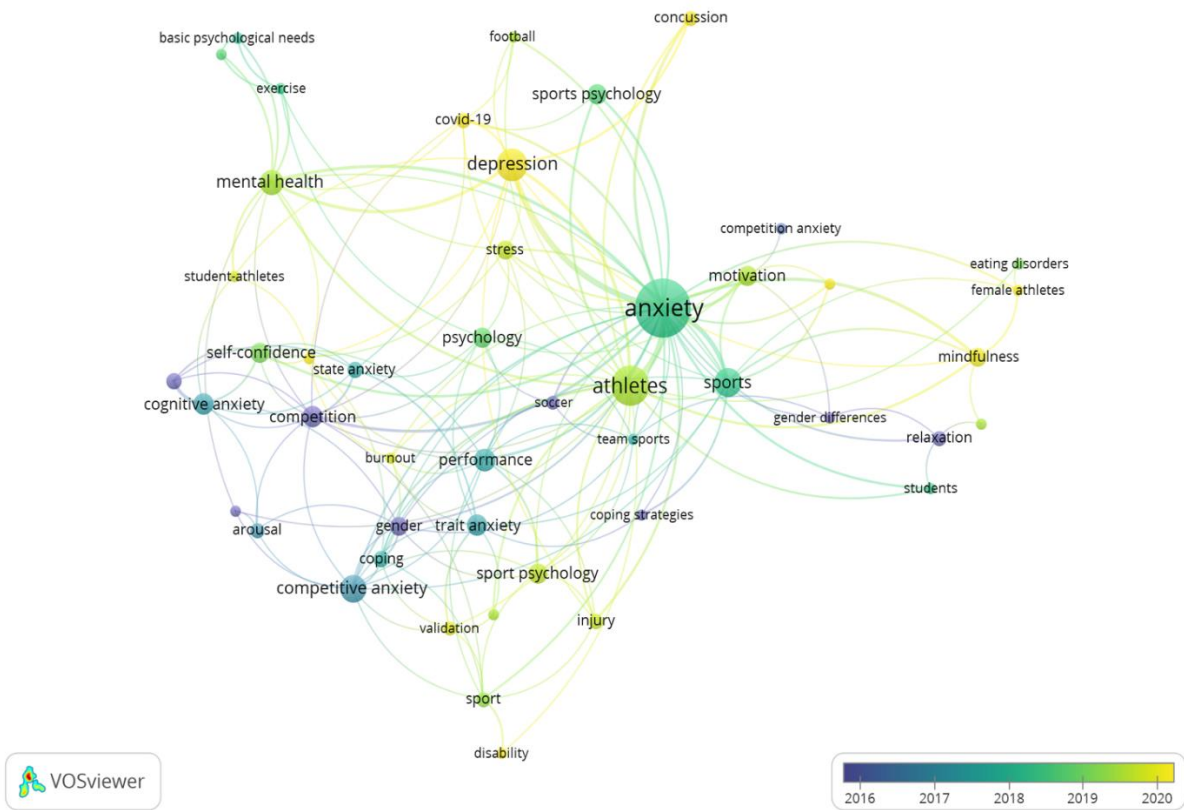
indexed by Scopus, they can be grouped into 6 clusters which can be identified through the node color of each keyword. Cluster 1 symbolized in red includes terms related to competitive anxiety, arousal, gender, performance, personality, psychology, soccer, sport psychology and team sport. Cluster 2, symbolized by the

color green, consists of cognitive anxiety, competition, mental health, resilience, self-confidence, somatic anxiety, state anxiety, and student-athletes.

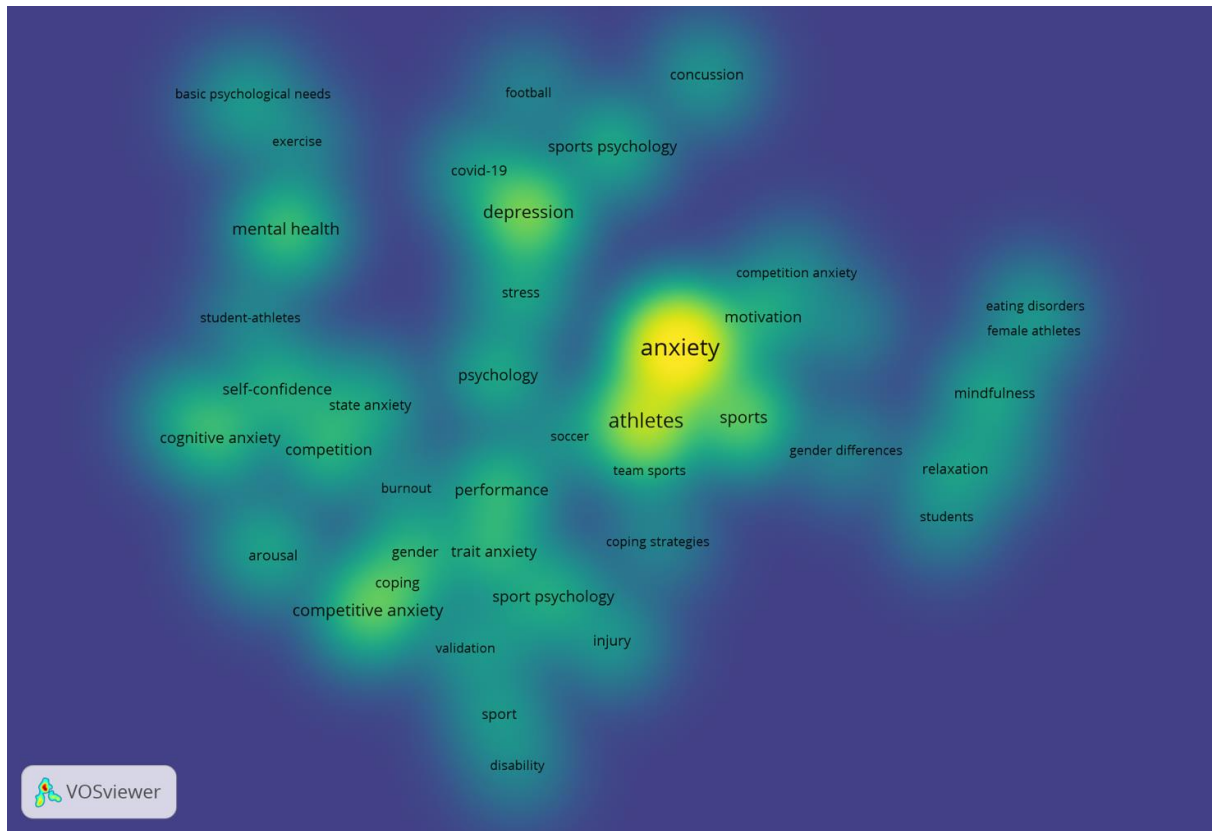
Cluster 3, which is symbolized in dark blue, consists of terms such as competitive state anxiety, eating disorders, female athletes, gender differences, mindfulness, relaxation, and students. Cluster 4, which is symbolized in yellow, consists of terms such as anxiety, athlete, concussion, covid-19, depression, football, and sports psychology. Cluster 5, which is symbolized in purple, consists of terms such as burnout, coping, strategic coping,

reliability, sport, trait anxiety and validation. Cluster 6, which is symbolized in light blue, consists of terms such as competition anxiety, emotional intelligence, motivation, sports, and stress.

Figure 4 explains the mapping and clustering of anxiety and athlete research trends based on historical traces or years of research publication. The information obtained from the Overlay visualization results in Figure 4 can be used as a reference for identifying and detecting the state of the art of research in the field of anxiety and athletes conducted in the 2012-2022 period.



**Figure 4.** Overlay Visualization in Co-Occurrence



**Figure 5.** Density visualization on co-occurrence

From the results of the visualization shown in Figure 5, it can be identified that there are dense areas that have a high density at one node with other nodes. The saturation level identified in the number of keywords marked in yellow means that the area is a topic that has been extensively researched and indexed by Scopus. Meanwhile, nodes marked with dark colors indicate that these topics have not been studied much.

## 4. Discussion

Based on the results of the bibliometric analysis, this study allowed researchers to identify new themes from several published articles in the Scopus-indexed journals about anxiety and athletes. This analysis also provides greater coverage of the articles analyzed (larger article dataset size) than other review studies as well as analyzes the relationships between the selected articles. With bibliometric analysis on density visualization which shows strain and low intensity indicating that research on anxiety and athletes related to football is still relatively low, this makes research on this topic still very broad to be researched.

Based on the bibliometric analysis above, there are still many aspects related to anxiety that have not been studied much. Research on how several factors are related to anxiety that is rarely studied is emotional intelligence,

eating disorders, personality, mindfulness, gender differences, personality, stress, and coping strategies. This work is not exempt from certain limitations, some of which could form the basis for future research. First, bibliometric analysis can also be developed using quantitative or qualitative tools which can provide some differences, especially in terms of citations. In addition, because the database is not updated immediately after the publication of articles, there may be slight variations in the number of articles collected in the Scopus and semantic scholar databases.

### 4.1. Type of Sports

Only 1 article was found regarding the comparison of athletes' anxiety levels based on sports, handball players had higher state anxiety and traits compared to volleyball players [22]. Meanwhile, another article discusses how anxiety affects the performance of athletes in soccer [23], handball [24], rhythmic gymnasts [25], baseball [26], taekwondo [27], athletic [28], golf [29], swim [30], rugby [31], archery [32], volleyball [33], badminton [34], water-polo [3], judo [35], and table tennis [36]. Then, individual sports athletes have higher anxiety and somatic anxiety than team sports athletes [37]. The result of the study of the total population (756 athletes), as many as 8 % reported suffering from anxiety or depression. A higher proportion of individual sports athletes reported anxiety or depression

than team sports athletes (13 % VS 7 %,  $p < 0.01$ ) [13]. However, no difference in the state and nature of anxiety was found between athletes in team sports and individual sports athletes [38].

#### 4.2. Competitive Level and Experience

Anxiety and stress affect both elite and amateur athletes in different ways [39]. Elite athletes who participate in more competitions are better able to control anxiety during training or competition [12]. Elite athletes who play at a higher competitive level usually report fewer symptoms of anxiety than athletes at a lower level of competition [40]. Younger athletes have higher anxiety and lower self-confidence scores compared to experienced athletes [3]. Young swimming athlete shows anxiety in Competitive preparation [41].

#### 4.3. Gender

Female soccer athletes reported symptoms of anxiety disorders more frequently than male soccer athletes [42]. Multidimensional anxiety levels in national elite sports are reported that female athletes have higher levels of performance anxiety, concentration problems, and somatic anxiety than men [43]. Anxiety levels in athletes differ by gender and type of sports like individual sports (eg. athletics, rock climbing, surfing, swimming, table tennis with team sports (eg. basketball, handball, rugby, soccer, volleyball) [44].

### 5. Conclusions

The exponential growth of anxiety and athlete studies over the period 2012-2022 is evidenced by the 196 articles extracted. These marked an increase in the publication of scientific articles studying the topic of anxiety and athletes from 2002-2022. The highest number of citations, namely in 2019, was 89 citations by researchers [11] entitled determinants of anxiety in elite athletes: a systematic review and meta-analysis.

Analysis of factors associated with anxiety among athletes provides important information for designing training and prevention programs so that problems with athlete's anxiety do not affect athlete performance. While research centers regarding anxiety subtypes in athletes broadly reflect differences in anxiety based on the type of sport, level of competition, and experience as well as gender. Despite data limitations, it appears that acceptable focused interventions for anxiety symptoms among the athlete population can improve athlete performance. While it remains to be seen how such an approach will improve athlete performance, the next decade is sure to represent a major investment in the mental health of athletes and the expansion of the sport. This study also provides an overview of sub-sections related to anxiety which are rarely discussed.

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