
ANALYSIS OF SCIENTIFIC PRODUCTION RELATED TO SPORTS PSYCHOLOGY IN SPORTS SCIENCE JOURNALS OF PORTUGUESE LANGUAGE

ANÁLISE DA PRODUÇÃO CIENTÍFICA RELACIONADA À PSICOLOGIA DO ESPORTE EM PERIÓDICOS DAS CIÊNCIAS DO ESPORTE DE LÍNGUA PORTUGUESA

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ABSTRACT

The aim of this study was to analyze scientific production related to sport psychology (SP) in journals of sports science. The electronic search in 15 journals of physical education was performed in August 2016. Altogether, 145 articles were selected. The first publication occurred in 1997. It was observed an increase in publications from 2007. The journal that most published about SP was Journal of Physical Education of State University of Maringá with 24 publications. The institutions UEM, UFJF, UFMG, USP and UDESC showed at least 10 publications each. Paraná, São Paulo and Minas Gerais were states with most publications. It was observed that most studies had cross-sectional design. At total, 49 sports were investigated, volleyball was the most studied, followed by Soccer and Basketball. Motivation was the theme of most of studies, especially in Soccer, as well as stress, anxiety and mood states. We concluded that there was an increase in scientific production about SP in the last decade. Themes applied to sport as mental training, techniques of activation and relaxation requires investigation.

Keywords: Sport Psychology. Review. Athletes. Motivation. Volleyball.

RESUMO

O objetivo do presente estudo foi analisar a produção científica relacionada à psicologia do esporte (PE) em periódicos das Ciências do Esporte. Realizou-se uma revisão sistemática que seguiu os critérios recomendados pela Declaração PRISMA em agosto de 2016 em 15 periódicos relacionados as Ciências do Esporte. Cento e quarenta e cinco estudos foram selecionados. O primeiro estudo encontrado sobre o tema foi publicado em 1997, sendo que houve aumento na produção de artigos a partir de 2007. O periódico que mais publicou sobre PE foi a Revista da Educação Física, da Universidade Estadual de Maringá com 24 publicações. As instituições que se destacaram em relação ao número de publicações foram: UEM, UFJF, UFMG, USP e UDESC, com mais de 10 estudos publicados cada. Os estados com maior número de publicações foram Paraná, São Paulo e Minas Gerais. No total 49 modalidades esportivas foram investigadas, sendo o Voleibol mais investigado, seguido pelo Futebol e Basquetebol. A motivação foi a variável psicológica mais investigada, além do estresse, ansiedade e estados de humor. Conclui-se que houve um aumento na produção de estudos sobre PE na última década. Temas aplicados ao esporte como treinamento mental, técnicas de ativação e relaxamento necessitam mais investigações.

Palavras-chave: Psicologia do Esporte. Revisão. Atletas. Motivação. Voleibol.

Introduction

Growth in the production of scientific knowledge has led researchers in several areas to conducted analysis of published studies and developed research, showing the importance of such analyses in the process of constructing and improving fields of knowledge¹⁻³.

Studies evaluating literary production on various subjects, identifying knowledge gaps, and seeking to direct future works are necessary⁴⁻⁶, as such studies highlight knowledge of the themes commonly addressed in the area and those that require further investigation by researchers⁷. Journals are the most used means for disseminating scientific research in order to legitimize and register advancements in knowledge⁸.

Sports psychology (SP) is the scientific field of study of emotions and behaviors in the sports environment, where the sports provide the place of practical application of knowledge.

Researchers in the SP field have two main aims: to understand how psychological aspects affect athletes' sporting performance and to analyze how participation in sports affects individuals' psychological development and mental health⁹.

As a sub-area of psychology and sports sciences, SP is an emerging field in Brazil, if we analyze the small number of congresses and disciplines in undergraduate courses¹⁰. In a recent study, Queiroz et al.¹¹ pointed out some reflections about the development of SP in Brazil, identifying the strengths and weaknesses of the area and indicating that SP in Brazil is still in the developmental stage in both high performance sports practice and research science¹¹. In addition, there is a need to reduce the distance from what is done in sports practice and what is investigated in theory¹².

In the area of psychology, Andrade et al.¹³ concluded that despite the increase in production related to this theme between 2010 and 2012, there remains little research production on SP, and such research has been concentrated in certain scientific journals from the psychology field. In a recent research, Vieira et al.¹⁴ investigated the state of the art of scientific production in SP in Brazil and found that most articles on the subject are published in journals linked to physical education. Considering the evolution of the sports sciences in Brazil and Portuguese-speaking countries and specifically of SP, there is a growing number of Portuguese-language publications in journals related to this field. Thus, there is a need to select publications focused on SP for analysis and further insight. Despite the number of published studies, some research gaps remain, and some important issues for a better understanding of research in the area have not been contemplated or sufficiently investigated, such as the institutions with the most publications in the area, the subjects of study, the sports investigated, and the number of athletes. In addition, our study brings a new approach to analysis, with the aim of understanding research on SP in journals in Portuguese language.

In addition to the broadening of analyses, this review is important because it allows us to update the state of the art in SP research, since the last revision observed on the subject was published in 2013¹⁴. Thus, this review fosters an understanding of the growth of scientific production, allows us to identify new knowledge gaps and possibilities for future research, and contributes to scientific advancement in the field. Therefore, the objective of the present study was to analyze the scientific production related to SP in sports science journals of Portuguese language.

Methods

This is a systematic review of literature that has followed the criteria recommended by the PRISMA Statement - Preferred Reporting Items for Systematic Reviews and Meta-Analyses¹⁵.

Eligibility criteria for journals

For delimitation, we chose to select studies published in the main journals related to sports sciences that publish articles in Portuguese language, observing the WebQualis and the title of the journal. After checking the journals in the sports sciences field, the following inclusion criteria for journals were used: a) publications in Portuguese language or those with an editorial body and headquarters established in Brazil; b) publications in journals with WEBQUALIS B2 or higher in physical education following the recommendations of the area 21 document (CAPES), in which criteria for the classification of journals are defined according to area adherence; and c) publications available online, indexed in Scielo or Lilacs.

We did not include specific SP journals to avoid possible bias in the number of selected studies from such journals.

After reviewing the eligibility criteria, 15 journals related to sports sciences were selected, as described in Table 1. Most of the journals are based in Brazil, in institutions located in São Paulo (5), followed by Paraná (3), Santa Catarina and Rio Grande do Sul (2), and Goiás (1). Two journals are based in institutions located in Colombia and Portugal, but they also publish article in Portuguese language.

Table 1. Journal characteristics

	Journal	WEB QUALIS	Frequency of publication	Institution
1	Acta Scientiarum - Health Sciences	B2	2 by year	Maringá State University
2	Educacion Fisica y Deporte*	B1	2 by year	Universidad de Antioquia - Colômbia
3	Motricidade	B1	4 by year	University of Trás-os-Montes e Alto Douro - Portugal
4	Motrivivência	B2	3 by year	Laboratory and Observatory of Sports Media
5	Motriz: Revista de Educação Física	B1	4 by year	Paulista State University
6	Movimento	A2	4 by year	School of Physical Education, Federal University of Rio Grande do Sul
7	Pensar a Prática	B2	4 by year	Faculty of Physical Education, Federal University of Goiás
8	Revista Brasileira de Atividade Física e Saúde (RBAFS)	B2	6 by year	Sociedade Brasileira de Atividade Física e Saúde/RS
9	Revista Brasileira de Biomecânica (RBB)	B2	3 by year	Brazilian Society of Biomechanics
10	Revista Brasileira de Cineantropometria e Desempenho Humano (RBCDH)	B1	6 by year	Nucleus of Research in kinanthropometry & Human Performance of the Federal University of Santa Catarina
11	Revista Brasileira de Ciências do Esporte (RBCE)	B1	4 by year	Brazilian College of Sports Sciences
12	Revista Brasileira Ciência e Movimento (RBCM)	B2	4 by year	Study Center of the Laboratory of Physical Fitness of São Caetano do Sul
13	Revista Brasileira de Educação Física e Esporte (RBEFE)	B1	4 by year	University of São Paulo
14	Revista Brasileira de Medicina do Esporte (RBME)	A2	6 by year	Brazilian Society of Exercise and Sports Medicine
15	Revista da Educação Física/UEM (REF)	B1	4 by year	School of Physical Education of the State University of Maringá/PR

Legend: *Publish in portuguese

Source: The authors.

Search strategy for studies

The search for studies occurred in August 2016 and was performed in the journal system using the logical operator OR with the following terms: Abandono OR Agressividade OR Ansiedade OR Atenção OR Ativação OR Autoconfiança OR Autodeterminação OR Autoeficácia OR Autoestima OR Burnout OR Coesão OR Cognição OR Concentração OR Cooperação OR Coping OR Depressão OR Dropout OR Emoções OR Estresse OR Feedback OR Flow-feeling OR Humor OR Imagem Corporal OR Liderança OR Mentalização OR

Motivação OR Percepção de Competência OR Perfeccionismo OR Personalidade OR Psicologia do Esporte OR Qualidade de Vida OR Saúde Mental OR Tempo de Reação OR Tomada de Decisão OR Treinamento Mental e Visualização. In the search scope of the journal system, "all" was selected.

Because of the limitation in the number of characters in the search field in the journal system, the search was performed by using at most five terms at a time, with the logical operator "OR." This strategy was used for the following journals: Acta Scientiarum – Health Sciences, Educacion Fisica y Deporte, Motricidade, Motriviência, Movimento, Pensar a Prática, Revista Brasileira de Atividade Física e Saúde (RBAFS), Revista Brasileira de Biomecânica (RBB), Revista Brasileira de Cineantropometria e Desempenho Humano (RBCDH), Revista Brasileira Ciência e Movimento (RBCM), Revista Brasileira de Educação Física e Esporte (RBEFE), and Revista da Educação Física/UEM (REF).

In the journals Motriz: Revista de Educação Física/UEM, Revista Brasileira de Ciências do Esporte (RBCE), and Revista Brasileira de Medicina do Esporte (RBME) only one term was used at a time in the search.

Eligibility criteria for studies

Only original articles with a sample of athletes and qualitative, quantitative, or mixed methods related to SP were considered for analysis. No time limit was set to include the entire publication period for the verification of trends in scientific production. Review articles, conference summaries, editorials, and letters were excluded.

Study selection and extraction data

The search procedures and selection of the articles were carried out by two researchers (FD, GV) independently, and in cases of disagreement, a third one (PC) was asked for a final opinion.

The initial analysis was performed after the exclusion of articles based on the title. Then, summaries of those not excluded in the first stage were read. In the next phase, all those selected by the abstract were fully examined according to the established inclusion criteria. Reasons for exclusion are listed in the flowchart (Figure 1).

To analyze and discuss the results, the following categories were defined, and two researchers (FD, RS) extracted the following data: year, journal, institution, Brazilian states and countries, study design, related sports, sample characteristics (sex of the participants and level), and theme related to SP.

The institution and states of all authors were computed for the analysis. If not informed in the article, the study design was classified based on the method description. Subjects were classified after reading the article, based on the main outcome investigated in the study. In the case that two or more subjects were investigated, the article was considered with respect to more than one theme. The thematic analysis was performed by two authors of the study (FD, DC), and in cases of disagreement, the opinion of a third party (GV) was requested.

The search of related journals resulted in 2832 publications. After reading the title, 320 articles were selected for the abstract phase. At this stage, 146 were excluded, leaving 174 for full reading. Afterward, 145 studies were included in the review (Figure 1).

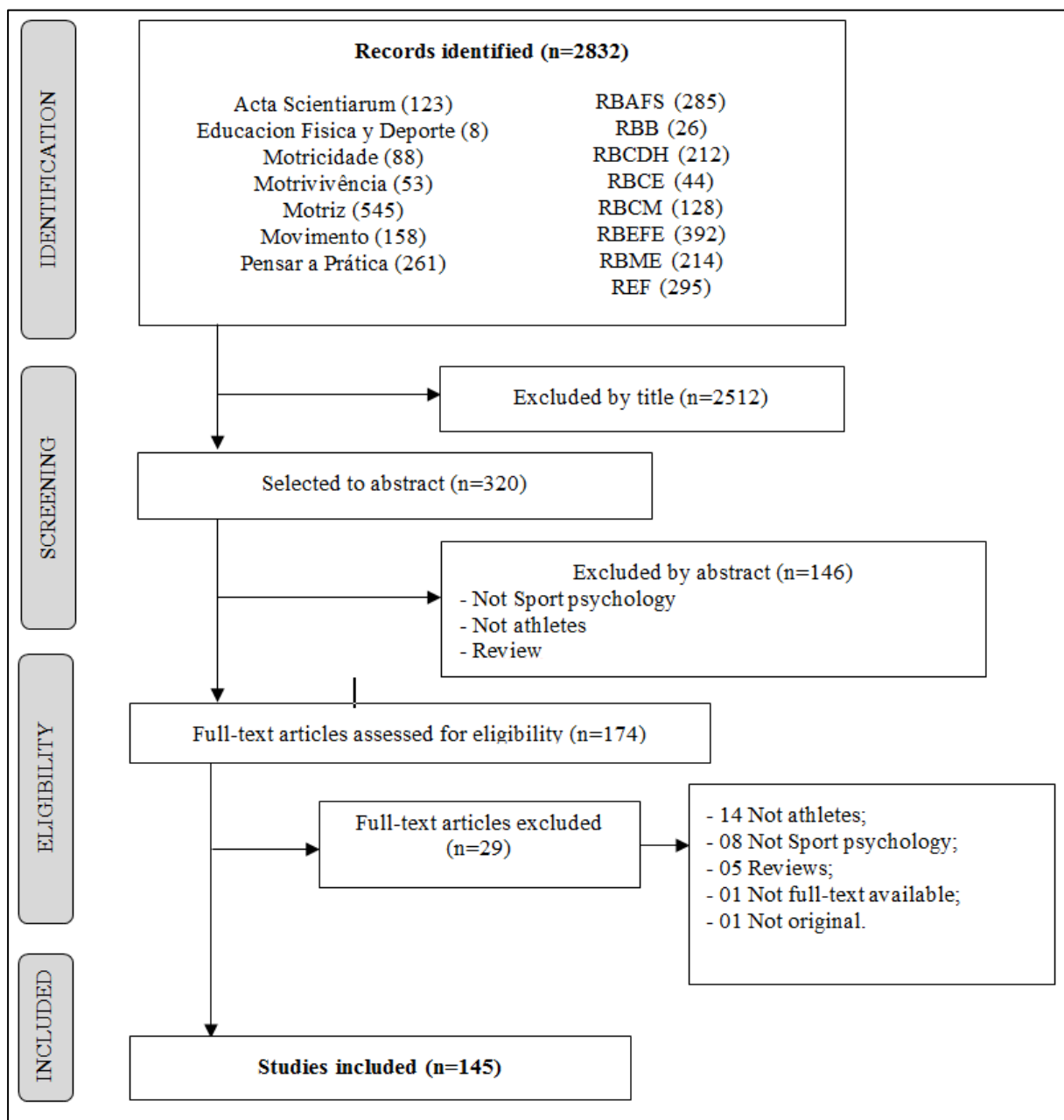


Figure 1. Flow diagram illustrating literature research and selection process of studies related to Sport Psychology in Sports Science journals

Source: The authors

Results

The first study published related to SP in a sports science journal was published in 1997. After a period without publications (from 1998 to 2001), there was an increase in the number of publications, especially in the years 2013 and 2014, which includes the largest number of published studies. It is observed that in the first decade (1997-2006), there were only 21 published studies, while in the last decade (2007-2016), there were 124 published studies.

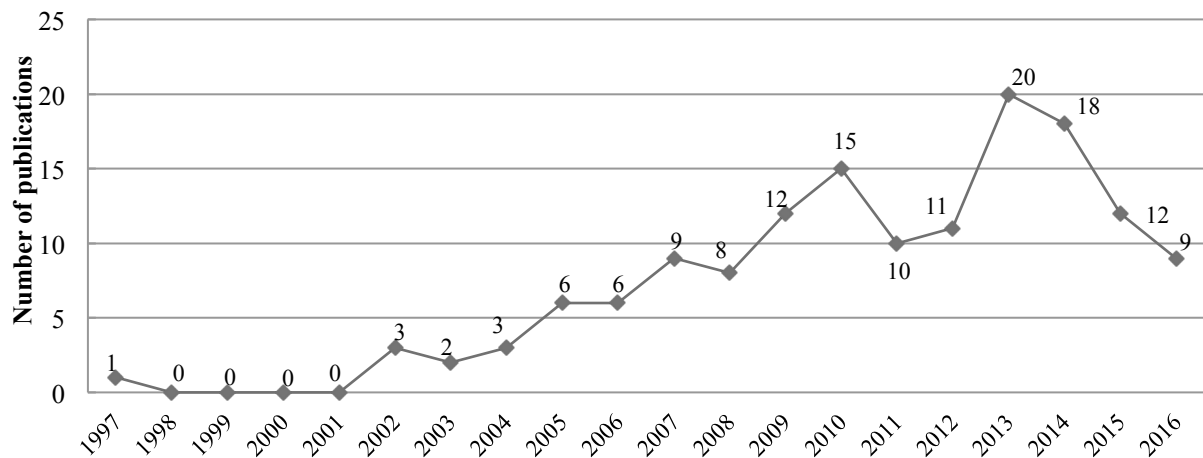


Figure 2. Number of publications by year related to Sport Psychology in sports science journals

Source: The authors

Thirteen of the fifteen investigated journals published studies related to SP. The journal that published the most articles on the subject was the Journal of Physical Education, of the State University of Maringá, with 24 publications, followed by Revista Brasileira de Cineantropometria e Desempenho Humano and Motricidade, with 21 and 20 studies published, respectively (Figure 3).

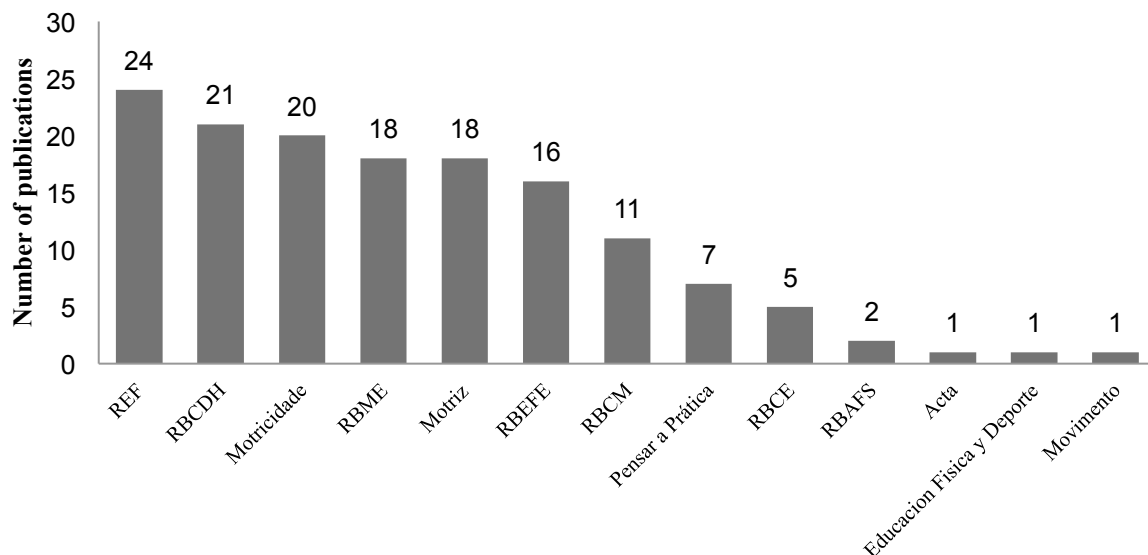


Figure 3. Number of publications related to Sport Psychology by journal

Source: The authors

The institutions with the most publications were UEM, UFJF, UFMG, USP, and UDESC, with more than 10 published studies each (Table 2). Twelve different institutions published two studies, and the majority ($n = 58$) published only one study. There were 14 institutions outside Brazil that also published articles in these journals (those in Canada, Colombia, Spain, the United States, England, Portugal, and the United Kingdom). Of the 66

higher education institutions located in Brazil, 32 are private, 21 are federal institutions, and 13 are state institutions.

Table 2. Number of publications related to Sport Psychology by Institution

Institution	Abreviation	n
State University of Maringá	UEM	32
Juiz de Fora Federal University	UFJF	20
Federal University of Minas Gerais	UFMG	19
São Paulo University	USP	18
Santa Catarina State University	UDESC	12
University of Trás-os-Montes and Alto Douro (Portugal)	UTAD	10
Federal University of Paraná	UFPR	9
São Judas Tadeu University	USJT	
Federal University of Rio Grande do Sul	UFRGS	8
Ingá College	-	7
Federal University of São Paulo	UNIFESP	
Campinas State University	UNICAMP	6
State University of Londrina	UEL	
Federal University of Santa Catarina	UFSC	5
University of Pernambuco	UPE	
Université du Québec à Trois-Rivières (Canada)	UQTR	
University Center of Belo Horizonte	UNI - BH	4
Paulista State University	UNESP	
Universidad de Las Palmas de Gran Canaria (Espanha)	ULPGC	
Federal University of Ouro Preto	UFOP	
Federal University of Pernambuco	UFPE	3
Nine of July University	UNINOVE	
State University of Santa Cruz	UESC	

Source: The authors

We found publications by authors of institutions from 7 countries. Twenty-one studies were found that included institutions from 6 countries abroad, with Portugal ($n = 9$), Canada ($n = 5$), the United Kingdom ($n = 3$), Colombia ($n = 1$), and the United States ($n = 1$). In only 16 studies (11%), there was a partnership between institutions in Brazil and abroad. Specifically in Brazil, most of the studies on SP published in sports sciences journals were focused on the southeastern and southern regions, with 81 and 73 publications, respectively, and the states with the highest number of publications were Paraná ($n = 46$ ($N = 43$, 29.6%)) and Minas Gerais ($n = 36$, 24.8%) (Figure 4).



Figure 4. Global geographical distribution and in Brazil of the publications about Sport Psychology in Sports Science journals

Source: The authors

A predominance of cross-sectional studies was found. Of the 145 studies selected in the review, 99 (68.2%) were classified as cross-sectional studies. Thirteen (9%) studies were had a qualitative research design, and 11 (7.6%) aimed at instrument validation. Experimental ($n = 8$, 5.5%) and longitudinal ($n = 6$; 4.1%) studies were less frequent. Three studies (2.1%) used a quantitative-qualitative approach, and five (3.5%) did not note the study design, and it was not possible to classify.

The most investigated sport was volleyball, which was examined in 39 studies (26%), followed by soccer and basketball, with 34 (23%) and 32 (22%) studies, respectively. Other noteworthy investigated sports were swimming and futsal, which were modalities investigated in 23 (15%) and 20 (13%) studies, respectively. The largest number of athletes (3214) investigated were involved in soccer, followed by volleyball (1895) and futsal (1593) (Figure 5). We investigated 30 individual modalities, 17 collective modalities, and one modality classified as a paradesport. One study did not specify the modality, describing the

sample as "several modalities." Regarding the total, athletes from 49 different sports modalities were investigated.

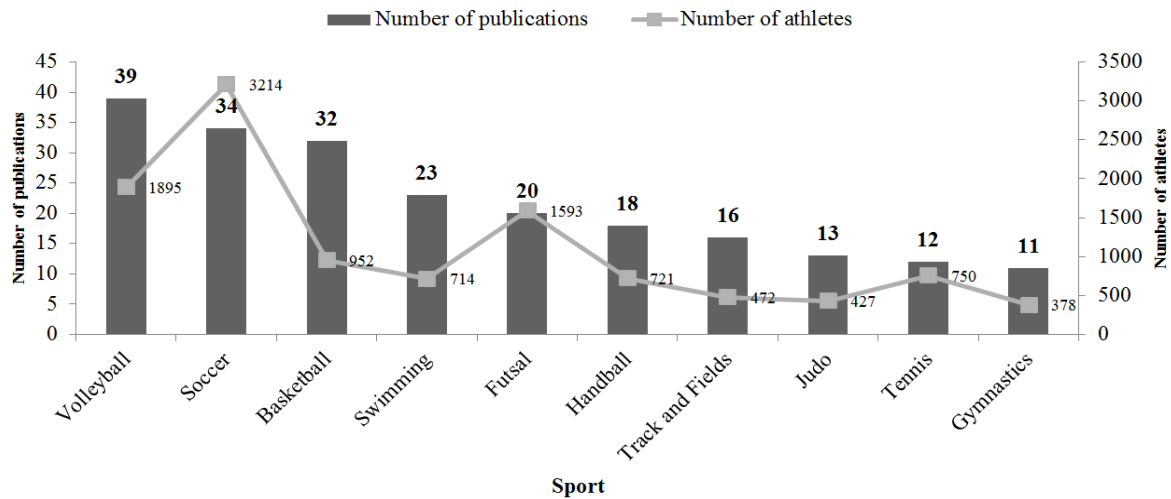


Figure 5. More investigated sports modalities and number of athletes in publications related to Sports Psychology in journals related to Sport Sciences

Source: The authors

In addition to the 10 most investigated sports modalities, sports such as rugby, running, and beach volleyball with 6 studies each; jiu-jitsu, karate, parasports, and rhythmic gymnastics with 5 studies each, and sailing and tae-kwon-do with 4 studies each were also investigated. Seven studies did not specify the investigated modality (being cited as "diverse"). It is noteworthy that in relation to the classification of the sports modality, 26 studies did not report the specification of what sport athletes practiced, totaling 8,286 athletes without classification regarding the sports modality.

We observed that there was no standardization in relation to the classification of the sample. Many studies refer to the sample according to age classification, while others classify the sample as children, adolescents, and adults—or between amateurs and professionals. Despite the great variety of nomenclature used, we realized that most of the studies were performed with adults ($n = 48$) or adolescents ($n = 33$). Among the studies with greater detail regarding the sample, a predominance of juvenile ($n = 23$), professional ($n = 22$), and child ($n = 11$) athletes was observed.

Still in relation to the sample, 72 studies used athletes of both sex; 54 were performed with male athletes, and only eight studies were performed with female athletes. Thirteen studies did not report whether they used female or male athletes. In relation to the number of individuals surveyed, it was very broad, ranging from two athletes surveyed to an "n sample" of 1,517. Of the total of 145 studies selected, 21,277 athletes were evaluated.

Motivation ($n = 26$), followed by stress ($n = 20$), anxiety ($n = 17$), and mood ($n = 14$) were the most investigated SP themes. In total, 40 different subjects related to SP were researched in sports science journals, and they are presented in Figure 6, where the size of the font indicates that more studies investigated this theme, with a smaller font indicating a smaller number of studies. Nonetheless, of the 145 studies selected, 27 were classified in more than one theme.

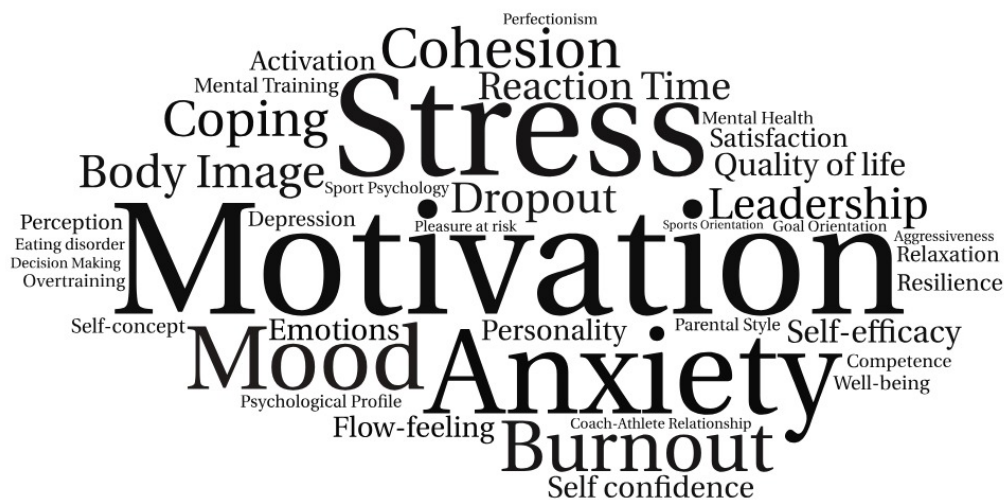


Figure 6. Themes of Sport Psychology investigated in Sports Science journals

Source: The authors

Motivation was a theme investigated mainly in soccer. Athletes' stress was also investigated mainly in soccer ($n = 6$) and basketball ($n = 5$). Anxiety was the subject of research mainly with respect to athletes of volleyball ($n = 8$), athletics ($n = 5$), combat sports, soccer, basketball, and handball ($n = 4$). Regarding mood, the most investigated sports modalities were soccer ($n = 4$) and athletics ($n = 3$).

Discussion

Evolution of scientific production related to sports psychology in sports sciences

Regarding the beginning of scientific production in SP in sports science journals, we observed that the first study was published in 1997, which investigated the pre-competitive anxiety of 120 adult and adolescent athletes of team and individual sports and was published in *Revista Movimento* by UEM researchers¹⁶. However, there was a four-year publication gap where only three other studies¹⁷⁻¹⁹ were published in 2002. These results corroborate those of Nascimento and Mascarenhas²⁰, who noted the beginning of research practice in the area of physical education in the late 1990s.

In the last decade, there has been a significant increase in the production of research on SP in sports sciences. This can be explained by the increase in masters and doctoral training, as a consequence of the increase in the number of postgraduate programs in physical education in Brazil, the greater investment in the research promotion agencies (CAPES and CNPq), and the evaluation method of postgraduate programs²¹.

Despite the observed increase in the number of publications in sports sciences journals written in Portuguese, Queiroz et al.¹¹ stated that research on SP in Brazil remains at a developmental stage. This can be noted from the existence of only one journal in Brazil with a focus and scope on this subject (*Revista Brasileira de Psicologia do Esporte*), which has been discontinued. Thus, the lack of specialized journals has led Brazilian researchers to publish in wider-ranging journals and to focus on other sub-areas, such as sports medicine, psychology, and, above all, physical education^{11,14}.

Compared with SP production in the psychology field, Andrade et al.¹³ found 39 studies in 14 different journals. The results of the present research show that there are more studies on SP published in sports science journals. Similarly, Vieira et al.¹⁴ found more

published studies on sports and exercise psychology in sports science journals than in psychology journals. According to Queiroz et al.¹¹, this difference is due to the greater presence of the SP discipline in the curricula of college courses directed to sports sciences in relation to psychology courses. Although Resolution 014/00 of 2000¹⁹ of the Brazilian Federal Council of Psychology (CFP) has regulated professional practice and training in the psychology of sports for psychologists, making this a specialty of the psychology field, we note that the greatest scientific production in SP belongs to researchers of sports sciences.

Demographic profile of scientific production in sports psychology

When we look at publications on SP, we find a concentration of studies developed by researchers from institutions in the southern and southeastern regions of Brazil. This result is in line with the findings of Andrade et al.¹³, who verified a greater number of publications related to PE in the psychology journals of researchers from the same regions. Still, these are the regions that present a high concentration of undergraduate and postgraduate courses with masters and doctorates related to CAPES' area 21, composed of Physical Education, Physical Therapy, Speech Therapy and Occupational Therapy²³. Institutions that have "stricto sensu" graduate programs, with research groups related to SP, were the ones that published most about SP in sports science journals, and these programs are also linked to the area of Physical Education¹⁴.

Methodological characteristics of scientific production on sports psychology

The scientific production in SP in sports sciences journals is predominantly cross-sectional, with a quantitative approach. Gomez et al.⁷ also found that this type of design is the most used in scientific production in SP, both in Brazil and abroad. In this type of research, it is not possible to test cause and effect hypotheses, since there is only observation of the occurrence of a phenomenon.

In addition, in our analysis, we verified that only 11 studies aimed to validate instruments, of which the Journal of Physical Education published five—among them, the validation of the Athletic Burnout Questionnaire for athletes in 2006 and a specific one for young athletes in 2016. However, according to Queiroz et al.¹¹, the validation of instruments in Portuguese is a strength of SP research in Brazil. Such divergence may be due to the fact that validated Portuguese scales have been published in other journals or in defended theses and dissertations. We emphasize the importance of publishing studies with the objective of validating instruments in journals in order to disseminate and expand the use of such scales valid for the reality of Brazilian sports, as well as the need to construct new instruments developed and adapted specifically for sports. Nonetheless, this low number of published articles on instrument validation is in line with what has been observed by Németh et al.²⁴, in an analysis of six journals on SP in English, who concluded that diagnostic studies, measures, and new methodologies have been published to a greater extent in the last ten years.

Trends of themes and sports investigated in sports psychology related to sports sciences

The predominance of SP investigations in volleyball, soccer/futsal, and basketball reflects the tradition and popularity of such sports in Brazil. It was with soccer in the 50s that SP had an initial mark in Brazil¹¹. The more researched sports in the SP area may also reflect the teaching of physical education in Brazil, which often prioritizes modalities such as soccer, basketball, volleyball, and handball in schools²⁵. Few studies have investigated sports that have grown in number of practitioners and popularity, such as surfing and skateboarding, which are now Olympic sports.

Although several themes were found, motivation was the most investigated theme among the selected studies (n=26), as in studies by Németh et al.²⁴, Lindahl et al.², Vieira et al.¹⁴, and Gomez et al.⁷. Motivation is a psychological variable that reflects athletes' search for daily optimization in performance and persistence in continuing to practice the same modality²⁶. Extensive research on the motivation of athletes possibly occurs owing to theories underlying such a theme, such as self-determination theory (SDT)²⁷, which has served as the theoretical basis for some of the studies analyzed²⁸⁻³¹.

Considering the needs of athletes with respect to their daily life^{12,29} and the various themes investigated in the articles, we find that there remains an important distance between theory and practice. Some themes, which allow greater application in the field, such as mental training, development of concentration, and arousal control techniques, remain the focus of a small number of investigations. Still in the application of knowledge, research on SP in Brazil still lacks studies with an experimental design, which is evidenced by the study of Gomez et al.⁷. Experimental studies are important because they allow testing methods to be applied to specific interventions.

This study presents some limitations. Specifically, there is the inclusion of journals only related to sports sciences, where the B2 minimum QUALIS may have left studies published in other journals outside the analysis. Owing to research on SP in Brazil being at a development stage¹¹ and the fact that the present study has focuses on research in journals in Portuguese language or with headquarters in Brazil, future studies analyzing the studies on SP developed in Brazil and published in international journals should be conducted.

Conclusion

Analysis of the scientific production on SP in sports science journals allows us to conclude that there has been an increase in the production of studies in the last decade, especially in the Physical Education Journal of UEM, from researchers of institutions in southern and southeastern regions. A cross-sectional design is the most frequent research design, and volleyball is the most investigated modality, mainly with respect to subjects such as motivation, stress, anxiety, and mood states.

In addition, future studies, mainly those with an experimental design and those aiming to validate new instruments, as well as those investigating less traditional modalities in Brazil but that offer evidence with respect to surfing and skateboarding, are needed. We also suggest that research focus on more applied and necessary subjects with respect to sports, such as mental training and the development of techniques of arousal control.

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