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Psychology research in women's soccer: a scoping review

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ABSTRACT

Previous research suggests that psychological factors play an important role in trying to explain and predict the participation, performance, and health of player and practitioners in soccer. However, most previous works have focused on specific research questions and included samples from male populations. As part of a larger Fédération Internationale de Football Association (FIFA) project aiming to steer women's soccer research, our purpose with this scoping review was to give an overview of the current state of psychology-related research within women's soccer. We searched five electronic databases up to April 2023, from which 280 original peer-reviewed articles met the inclusion criteria. Included records were inductively coded into 75 specific research topics and nine broader research categories. Population characteristics within each topic and category, and overall publication trends, were identified. The results revealed a growth in research attention, with notable increases in publication rates around the international competitions years, over the last two decades. While a notable number of abstracts did not report sufficient details about population age and/or playing levels, senior elite players were identified as the most common population studied. Most studies examined several topics from different research categories, with research focusing on emotions, moods and/or environmental factors, and the specific the topics of anxiety, stress, and coach behavior, receiving most research attention. Our study provides an informative mapping of all psychology-related research activity within women's soccer, which will enhance researchers' understanding of the current quantity of literature within this complex, heterogeneous, and growing area of research.

ARTICLE HISTORY

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KEYWORDS

Female; girls; ladies; football; psychological factors


In recent years, there has been a substantial development of women's soccer, with increasing participation rates (Fédération Internationale de Football Association 2020), professionalization of elite playing standards (Union of European Football Associations 2017), and audiences at elite senior competitions (UEFA; 2017, 2019; FIFA 2020). Several governing initiatives have been implemented to support this development. For example, during the period 2020–2022, FIFA committed to invest one billion USD to accelerate the growth of women's soccer (FIFA 2020). Alongside this increased recognition, there has been a notable increase in the volume of literature focusing on women's soccer. In a recent scoping review of all research within women's soccer, Okholm Kryger et al. (2021) identified 15 research themes (e.g., medicine, biomechanics, nutrition, strength and conditioning, psychology), where substantial increases in publication rates over the last two decades were reported for most research themes.

The current study follows up from this broader scoping review by Okholm Kryger et al. (2021), by focusing specifically on literature covering psychology-related topics. While previous research suggests that psychological factors play an important role in trying to explain and predict the participation (e.g., Møllerløkken et al. 2015; Temple and Crane 2016;

Schlesinger et al. 2018), performance (e.g., Casanova et al. 2009; Ivarsson et al. 2019; Williams et al. 2020), and health (e.g., Hill et al. 2008; Adie et al. 2010; Kuettel and Larsen 2020) of players and practitioners in soccer, the vast majority of previous works have focused on specific research questions and included samples from male populations. It has been questioned whether findings that apply to men's soccer can provide us with an accurate and comprehensive understanding of relevant phenomena within women's soccer (Okholm Kryger et al. 2021). To date, no attempts have been made to scope the literature on all psychology-related topics in women's soccer.

The current work qualifies as a scoping review as it seeks to map and synthesize information about the population characteristics and research topics examined within a broad area of research (i.e., psychology-related research within women's soccer), rather than addressing a particular research question (Peters et al. 2015). Scoping reviews are valuable because they give a clear overview of the current volume of literature within a given area, which can be used to identify research gaps and make recommendations for future research (Peters et al. 2015; Munn et al. 2018). Therefore, the aim of this study was to scope the available peer-reviewed literature on all psychology-related topics

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within women's soccer published in English, French, German, and Spanish (i.e., the former official FIFA languages¹). Further understanding of the current quantity of literature within this complex, heterogeneous, and growing research area is essential in order to identify what topics are currently being addressed, open up debates about knowledge gaps, and steer future research directions.

Methods

The study was conducted in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist (Tricco et al. 2018), and the recommended best practice guidelines for scoping reviews by Levac et al. (2010).

The initial literature search was performed by Okholm Kryger et al. (2021) on 15 December 2019 with the purpose of covering all literature, including psychology-related research, published within women's soccer. This search covered all publication dated up to the search date using five electronic databases: PubMed, PsycINFO, Web of Science, Scopus, and SPORTDiscus. The following search terms and

Booleans were used verbatim: *football OR soccer AND female* OR woman OR women OR ladies OR lady*. In the current study, we conducted two updated literature searches, using the same databases and search terms employed by Okholm Kryger et al. (2021). The first updated search was done on 18 January 2022 and covered publication dates between 15 December 2019 and 18 January 2022. The second updated search was conducted on 13 April 2023 and covered publication dates between 18 January 2022 and 13 April 2023 (see Figure 1). Articles were then assessed for eligibility using the inclusion and exclusion criteria presented in Table 1. The search strategies and selection procedures employed are further described in the study by Okholm Kryger et al. (2021). Importantly, unlike the study by Okholm Kryger et al. (2021) in which all aspects of women's soccer were included, only research on psychology-related topics was eligible for inclusion in the current study. The protocol for the scoping review by Okholm Kryger et al. (2021) was pre-registered with the Open Science Framework on 15 January 2020 (<https://osf.io/gp7fb/>) and the protocol for this follow-up scoping review on psychology research is available on request from the corresponding author.

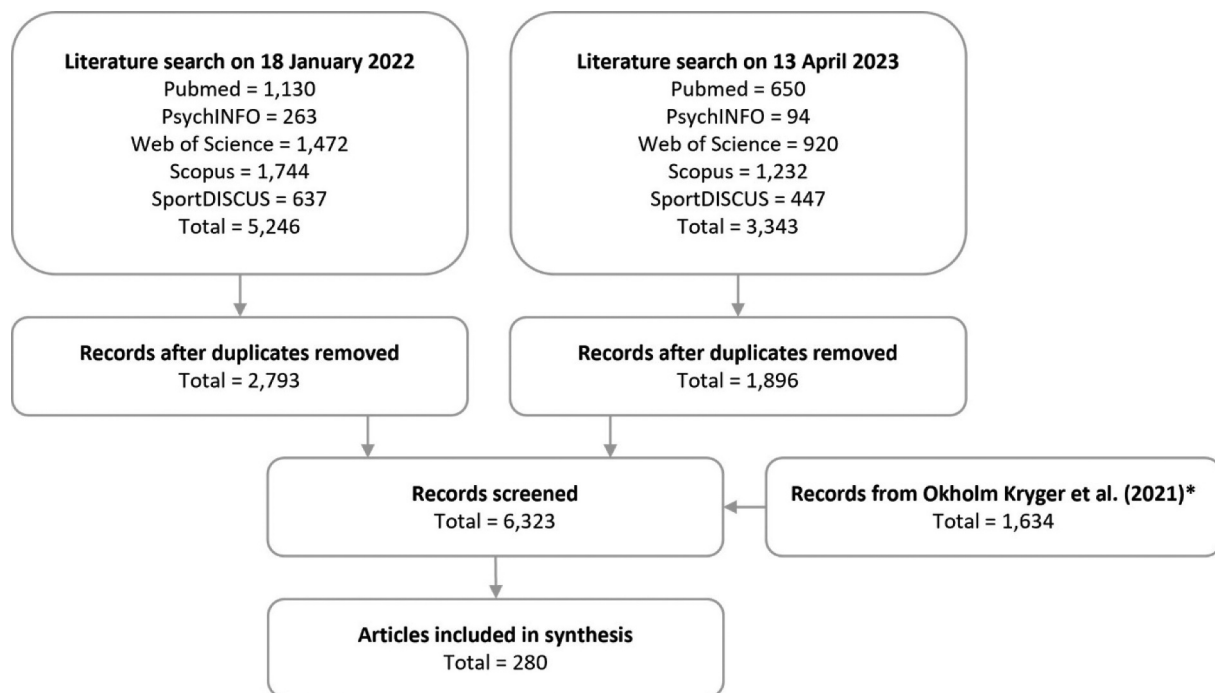


Figure 1. Flow chart of the study inclusion process. * literature search conducted on 15 December 2019 and articles screened for all subjects concerning women's soccer.

Table 1. Inclusion and exclusion criteria applied in the selection procedures.

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • Players and coaches in women's soccer • Psychology-related topic* • All levels of play • All ages • Peer-reviewed journals • All original study types • Published English, French, German, Spanish 	<ul style="list-style-type: none"> • No sex mentioned • Mixed-sex soccer • Outcome merged with male results • Outcome merged with other sports • Female players/coaches in male soccer • Non-organised soccer (e.g., physical education, playground soccer) • Street, beach, small-sided soccer, or futsal • Non-players/coaches (e.g., referees, spectators)

Note: * Mental or behavioral characteristics of an individual or group.

Data extraction

The title, author(s), year of publication, journal outlet, and abstract of each article were exported from Rayyan QCRI (Qatar Computing Research Institute, Doha, Qatar; records from the initial literature search on 15 December 2019) and Mendeley (Elsevier, Amsterdam, Netherlands; records from the updated literature searches on 18 January 2022 and 13 April 2023) into a Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, USA). Based on the information provided in the abstracts of the articles, the first author extracted information about the populations examined (i.e., player/coach, level of age, and level of play; classifications of age and playing levels are adopted from Okholm Kryger et al. 2021 and described in Tables 2 and 3, respectively) and inductively coded the articles into psychology-related research topics and categories. The first and last author met regularly throughout the data extraction process to discuss uncertainties in the coding of articles and the definitions of research topics and categories.

Data charting and reporting

Data were charted by the first author in Microsoft Excel (Microsoft Corporation, Redmond, USA) using line charts for continuous data (publication year), and bar charts for categorical data (journal outlet, population characteristics, research categories, and research topics). The first and last author met regularly to discuss the results and continuously updated the data charting form. It must be noted that if a study covered more than one topic, category and/or population group, that study was assigned to each of the topic, category and/or population group covered. That is, a single study could be included in multiple topics, categories and/or population groups. For example, if a study investigated three research topics from two different research categories among two different population groups, it was reported under each of the topic, category and population group examined. As

the aim of the current review was to provide a descriptive overview of the research focus, population characteristics, and overall publication trends within the current body of psychology research in women's soccer, no critical appraisal of individual sources of evidence was conducted (Tricco et al. 2018).

Results

The updated literature searches on 18 January 2022 and 13 April 2023 yielded 5,246 and 3,343 results, respectively. After removal of duplicates using Mendeley ($n = 2,453$ and $n = 1,447$, respectively) and inclusion of records from the study by Okholm Kryger et al. (2021; $n = 1,634$), the abstracts of 6,323 articles were screened; of these, 280 articles conformed to the eligibility criteria presented in Table 1 and were included in the synthesis of this study (see Appendix 1). The study inclusion process is illustrated in Figure 1.

Overall publication tendencies

Figure 2 illustrates the yearly publication rate on psychology-related topics within women's soccer. The oldest publications ($n = 3$) were dated 1979, yet only three articles were published in the subsequent 10 years. From 1995 and onwards, at least one article was published each year with a notable increase in publications from 2003 ($n = 3$) to 2004 ($n = 9$). Since 2004, at least six articles were published each year, with the exception of 2010 ($n = 3$). From 2015 and onwards, the yearly publication rate was at least 10 articles, with a peak in number of publications noticed in 2022 ($n = 43$).

Research on psychology-related topics within women's soccer was published in 124 different peer-reviewed journals, of which The Sport Psychologist contained the highest collection of articles ($n = 12$). Journals with five publications or more are listed in Figure 3.

Table 2. Descriptions of age grouping applied.

Age group	Descriptor
Pre-senior	Players below the age of 16
Senior	Players competing in senior soccer 16 years or older
Retired	Players no longer competing

Note: If the age of participants was not reported: Adolescent grouped as both pre-senior and senior; Championship/Cup/Top Leagues grouped as senior; College/University grouped as senior; High school (Y12–17) hence grouped as both pre-senior and senior; Junior can refer to junior/senior soccer team or high school/college-junior hence not identified (N/A); National team (incl. Olympics) grouped as senior; Professional and semi-professional grouped as senior; Scholastic not identified (N/A); Youth grouped as both pre-senior and senior.

Table 3. Descriptions of level of play grouping applied.

Playing level	Descriptor
Recreational	Any amateur recreational but competitive level of women's soccer
College	Player competing for a university or college
High level	Highly skilled but below best national or international level
Elite	Highest level of women's soccer. Represented as national team and best national league

Note: Highly trained grouped as high level; High performance grouped as high level; Professional grouped as elite; Semi-professional grouped as high level; Second or third best division grouped as high level.

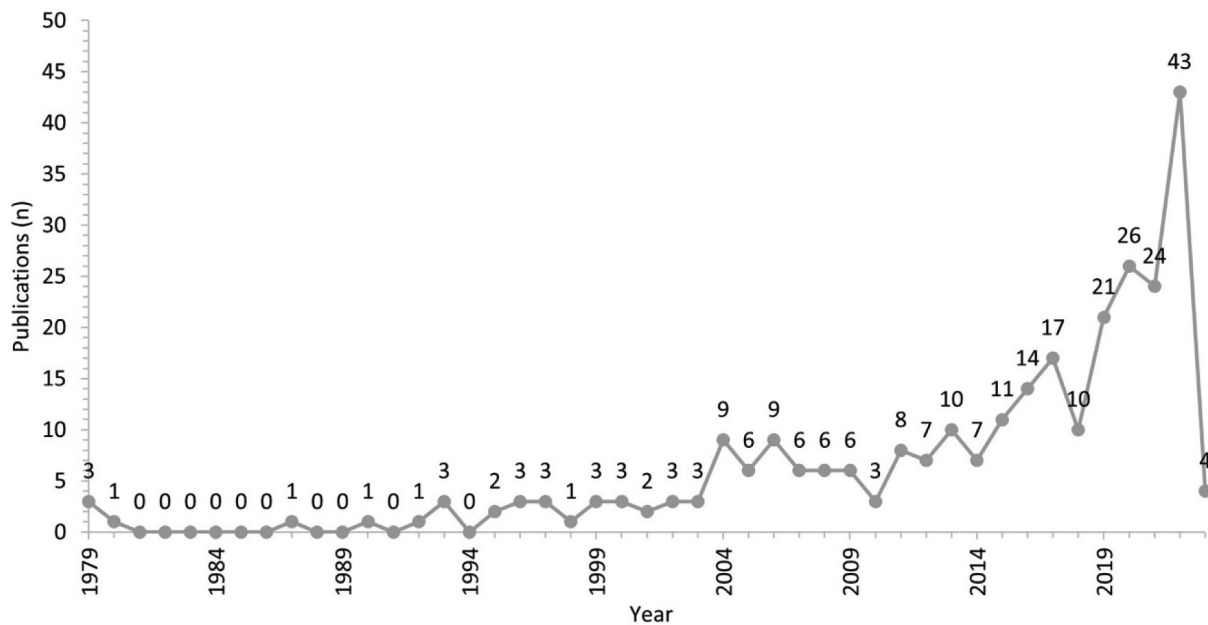


Figure 2. Publications on psychology-related topics within women's soccer per year (data up to 13/04/2023).

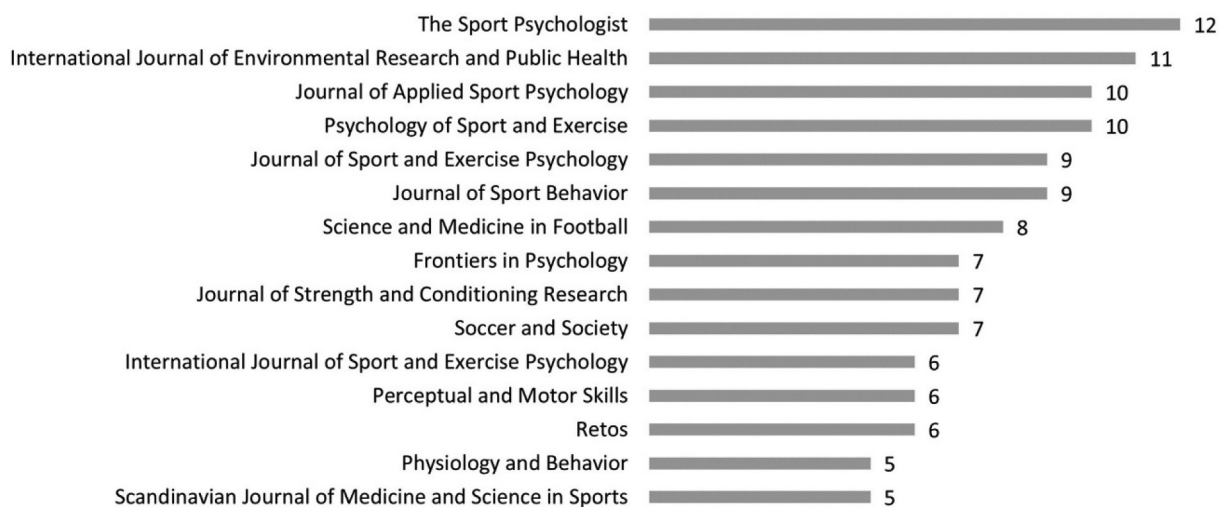


Figure 3. Journals with at least five publications on psychology-related topics within women's soccer.

Overall population characteristics

Players constituted the study populations in 274 of the 280 studies identified in this review, while coach populations were examined in 23 studies; in 17 of these studies, both players and coaches were investigated. Most studies ($n = 196$) examined populations within senior soccer (i.e., players competing in senior soccer 16 years or older), while fewer studies ($n = 105$) looked at players/coaches within pre-senior soccer (i.e., players below the age of 16). Of these studies, 78 studies examined both age groups, while 57 of the articles included in this review did not provide any information about the age of the populations studied. Of those studies that reported playing levels of the populations studied, 86 studies covered elite soccer, 37 studies examined college soccer, 34 studies looked at recreational soccer, and 17 studies examined players/coaches within high-level soccer. Two studies examined retired players,

whereas 116 articles did not report playing levels of the study populations. Nine studies examined populations from two or more playing levels (elite and recreational, $n = 7$; elite and high level, $n = 4$; high level and recreational, $n = 1$; high level and retired, $n = 1$). Population characteristics per research category and topic are reported in Figures 4–11.

Research categories and topics

The 280 articles were coded into 75 specific research topics (for definitions of each research topic, see Appendix 2) and nine broader research categories: i) Emotions/moods/feelings, covering topics related to any long- or short-lived emotional states and/or affective responses to a specific matter or event, ii) Environmental factors, covering topics related to contextual and interpersonal factors in a player's local soccer environment,

		Total	Anxiety	Stress	Depression	Fatigue	Well-being
Player/ coach	Total	104	47	37	28	26	18
	Player	103	47	37	28	26	18
Level of play	Coach	6	2	0	0	0	1
	Elite	33	13	11	13	8	6
	High level	5	2	2	0	0	0
	College	19	12	7	7	7	2
	Recreational	7	3	1	2	3	2
Age group	Retired	1	1	0	1	0	0
	Not reported	41	16	16	9	9	8
	Senior	81	38	29	26	24	14
Age group	Pre-senior	37	15	12	6	9	9
	Not reported	16	7	7	2	2	2
		Tension	Anger	Confusion	Vigor	Emotions/moods (undefined)	Enjoyment
Player/ coach	Total	16	15	15	15	11	8
	Player	16	15	15	15	11	8
Level of play	Coach	0	0	0	0	0	3
	Elite	4	4	4	4	4	4
	High level	0	0	0	0	1	0
	College	8	7	7	7	0	1
	Recreational	2	2	2	2	1	2
Age group	Retired	0	0	0	0	0	0
	Not reported	3	3	3	3	6	5
	Senior	15	14	14	14	8	6
Age group	Pre-senior	3	3	3	3	5	7
	Not reported	1	1	1	1	3	0
		Burnout	Arousal	Flow	Loneliness		
Player/ coach	Total	5	2	2	1		
	Player	4	2	2	1		
Level of play	Coach	2	0	0	0		
	Elite	1	0	0	0		
	High level	0	0	0	0		
	College	2	1	0	1		
	Recreational	1	0	0	0		
Age group	Retired	0	0	0	0		
	Not reported	1	1	2	0		
	Senior	5	2	1	1		
Age group	Pre-senior	2	1	1	0		
	Not reported	0	0	1	0		

Figure 4. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Emotions/moods/feelings.

iii) Self-appraisal, covering topics related to one's description and/or evaluation of oneself, including psychological and physical characteristics, qualities, skills, roles and so forth, iv) Performance motives/beliefs, covering topics related to one's motivations and/or performance expectations with regard to soccer participation, v) Perceptual and cognitive abilities/skills, covering topics related one's use of the perceptual and cognitive system to solve a task and/or deal with internal and/or external demands (note: topics related to the impact of injury in perceptual and cognitive functions were not included in this category, as the majority of these studies focused on the impact of concussions which was categorized as medicine/injury, but not psychology, in the study by Okholm Kryger et al. 2021), vi) Player strategies/behaviors, covering topics related to certain behaviors exhibited by a player in relation to others and/or in response to a specific matter or event, vii) Attitudes, covering topics related one's evaluation of others and/or a specific matter or event on a dimension ranging from negative to positive, viii) Personality traits, covering topics related to the relatively stable internal characteristic that is inferred from a pattern of behaviors, attitudes, feelings, and habits in the individual, and ix) Other, covering psychology-related topics that do not fit within any of the other categories.

Emotions/Moods/Feelings

Within the research category Emotions/moods/feelings, we identified 104 articles that were coded into at least one of 15 different research topics. The most common topic was Anxiety ($n = 47$), followed by the topics Stress ($n = 37$), Depression ($n = 28$), Fatigue ($n = 26$), Well-being ($n = 18$), Tension ($n = 16$), Anger ($n = 15$), Confusion ($n = 15$), Vigor ($n = 15$), Emotions/moods/feelings (undefined; $n = 11$), Enjoyment ($n = 8$),

Burnout ($n = 5$), Arousal ($n = 2$), Flow ($n = 2$), and Loneliness ($n = 1$). Of the 104 articles within this research category, 85 studies examined more than one research topic (two topics, $n = 32$; three topics, $n = 16$; four topics, $n = 14$; five topics, $n = 5$; six topics, $n = 4$; seven topics, $n = 7$; eight topics, $n = 6$; ten topics, $n = 1$). Of these multiple-topic studies, 51 studies included topics from more than one research category (two categories, $n = 31$; three categories, $n = 12$; four categories, $n = 7$; five categories, $n = 1$). The population characteristics for the research category Emotions/moods/feelings, as well as the population characteristics per research topic within this category are reported in Figure 4.

Environmental factors

In total, 65 articles and six research topics were identified within the research category Environmental factors. The most frequently covered topic was Coach behavior/relation ($n = 37$), followed by Motivational climate ($n = 20$), Teammate behavior/relation ($n = 14$), Parent behavior/relation ($n = 7$), Role model ($n = 3$), and Opponent relation ($n = 1$). Multiple research topics were examined in 46 of the studies within this research category (two topics, $n = 21$; three topics, $n = 14$; four topics, $n = 2$; five topics, $n = 8$; seven topics, $n = 1$), and 41 of these studies covered topics from more than one research category (two categories, $n = 25$; three categories, $n = 9$; four categories, $n = 5$; five categories, $n = 2$). Figure 5 presents the overall population characteristics for the research category Environmental factors, as well as the population characteristics for each research topic within this category.

Self-appraisal

The research category Self-appraisal comprised 63 articles and eight different research topics. Competence was the most

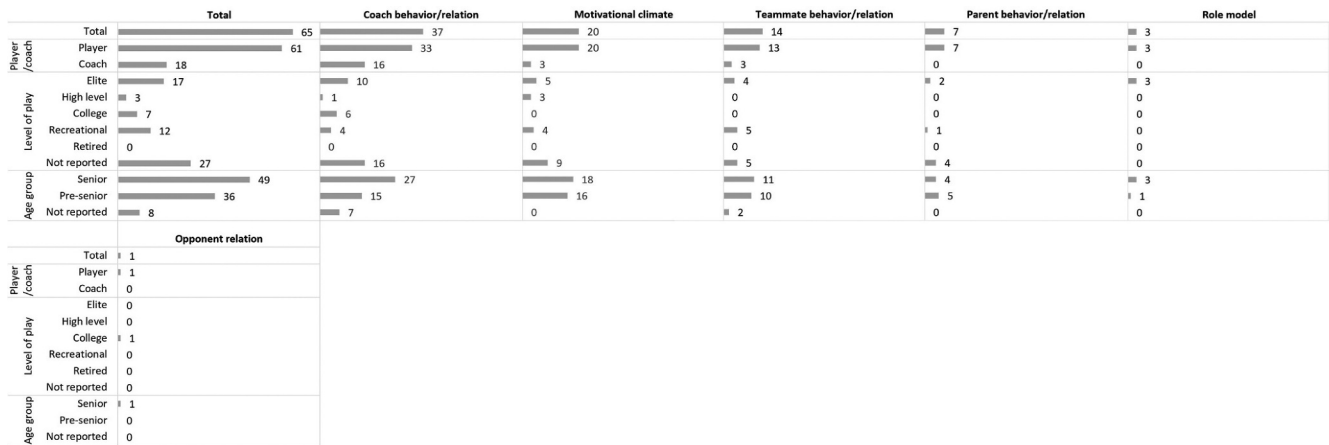


Figure 5. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Environmental factors.

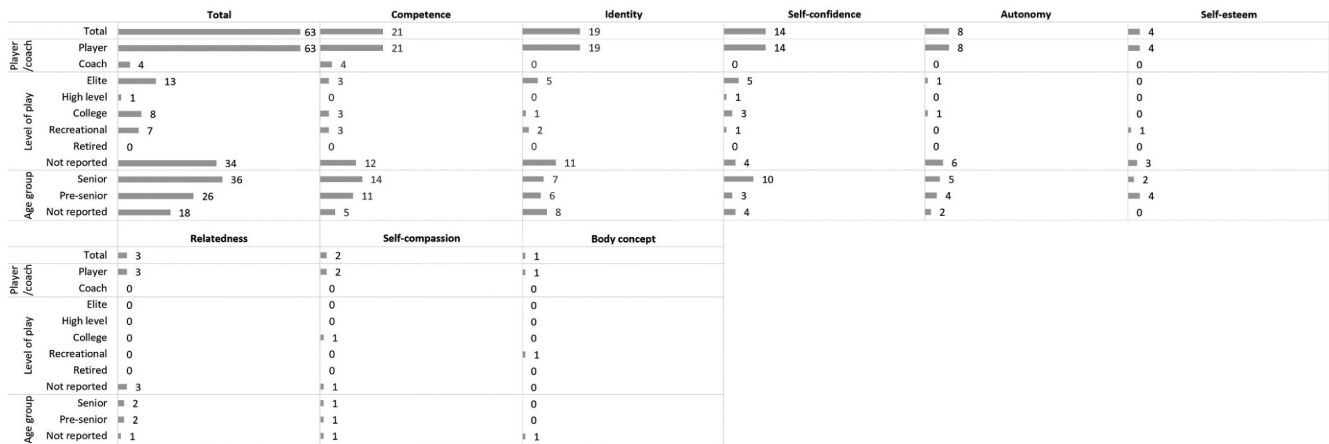


Figure 6. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Self-appraisal.

common research topic ($n = 21$), followed by Identity ($n = 19$), Self-confidence ($n = 14$), Autonomy ($n = 8$), Self-esteem ($n = 4$), Relatedness ($n = 3$), Self-compassion ($n = 2$), and Body concept ($n = 1$). In 45 of these 63 studies, multiple research topics (two topics, $n = 12$; three topics, $n = 14$; four topics, $n = 8$; five topics, $n = 7$; six topics, $n = 1$; seven topics, $n = 2$; eight topics, $n = 1$) across several research categories (two categories, $n = 22$; three categories, $n = 13$; four categories, $n = 7$; five categories, $n = 2$) were examined. The overall population characteristics for the research category Self-appraisal and the population characteristics for each specific research topic within this category are presented in Figure 6.

Performance motives/beliefs

Within the research category Performance motives/beliefs, 55 articles were coded into at least one of five different research topics. The majority of articles were coded into the topics Achievement goal ($n = 23$) and/or Performance motives/beliefs (undefined; $n = 21$). Ten studies covered the topic Intrinsic/extrinsic motivation, whereas the topics Locus of control and Outcome expectancy were covered in four and three studies, respectively. Multiple research topics were examined in 38 of these 55 studies (two topics, $n = 16$; three topics, $n = 9$; four topics, $n = 4$; five topics, $n = 8$; seven topics, $n = 1$), with 36 of these studies covering topics

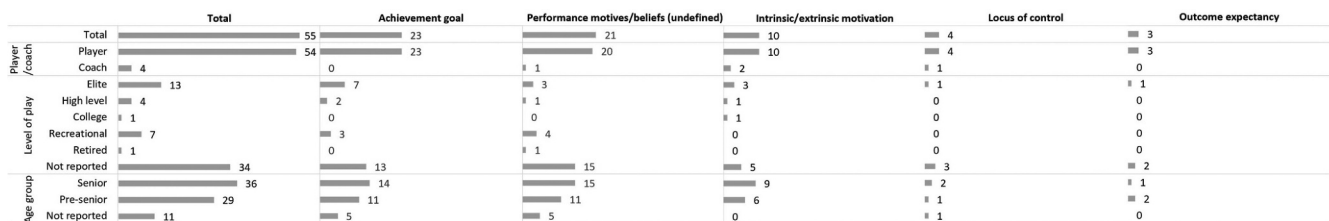


Figure 7. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Performance motives/beliefs.

from more than one research category (two categories, $n = 18$; three categories, $n = 8$; four categories, $n = 5$; five categories, $n = 5$). Figure 7 presents the overall population characteristics and the population characteristics for each specific research topic within the research category Performance motives/beliefs.

Perceptual and cognitive abilities/skills

Twenty-one different research topics were identified from 53 articles within the research category Perceptual and cognitive abilities/skills. Perceptual and cognitive abilities/skills (undefined), Decision making, and Imagery were the most common research topics, covered by ten, eight, and seven studies, respectively. The other topics covered within this research category were Self-talk ($n = 5$), Mindfulness ($n = 5$), Goal setting ($n = 4$), Relaxation ($n = 4$), Anticipation ($n = 3$), Emotional control ($n = 3$), Attentional control ($n = 3$), Emotional intelligence ($n = 3$), Gaze behavior ($n = 3$), Activation ($n = 2$), Pattern recognition ($n = 2$), Executive function ($n = 2$), Visuospatial function ($n = 2$), Automaticity ($n = 1$), Creativity ($n = 1$), Problem solving ($n = 1$), Cognitive control ($n = 1$), and Choice reaction time ($n = 1$). Two research topics or more were examined in 26 of the studies within this research category (two topics, $n = 12$; three topics, $n = 3$; four topics, $n = 4$; five topics, $n = 4$; six topics, $n = 1$; seven topics, $n = 1$; ten topics, $n = 1$); 22 of these studies covered

topics from more than one research category (two categories, $n = 12$; three categories, $n = 4$; four categories, $n = 3$; five categories, $n = 3$). The population characteristics for the research category Perceptual and cognitive abilities/skills, as well as the population characteristics per research topic within this category are reported in Figure 8.

Player strategies/behaviors

Within the research category Player strategies/behaviors, we identified 34 articles that together covered the five research topics Coping ($n = 15$), Aggression ($n = 11$), Pro/social behavior ($n = 5$), Leadership ($n = 2$), and Risk taking ($n = 1$). Twenty-seven of these studies examined multiple research topics (two topics, $n = 11$; three topics, $n = 6$; four topics, $n = 3$; five topics, $n = 6$; six topics, $n = 1$) across two or more research categories (two categories, $n = 13$; three categories, $n = 7$; four categories, $n = 3$; five categories, $n = 4$). The overall population characteristics, as well as the population characteristics for each specific topic within the research category Player strategies/behaviors are presented in Figure 9.

Attitudes

Within the research category Attitudes, 33 studies were coded into at least one of four different research topics (Team cohesion, $n = 18$; Team competence, $n = 9$; Morality, $n = 8$; Soccer appraisal, $n = 5$). In 30 of these studies, two or more research topics were covered (two topics, $n = 14$; three topics, $n = 5$; four topics, $n = 4$; five topics, $n = 6$; seven topics, $n = 1$) and 28 studies covered research topics

Player /coach	Total	P&C abilities/skills (undefined)		Decision making		Imagery		Self-talk		Mindfulness	
		Player	Coach	Player	Coach	Player	Coach	Player	Coach	Player	Coach
Elite	18	2	0	3	0	1	0	2	0	0	0
High level	2	0	0	0	0	0	0	0	0	0	0
College	8	3	0	1	0	2	0	1	0	3	0
Recreational	10	1	0	0	0	1	0	1	0	2	0
Retired	0	0	0	0	0	0	0	0	0	0	0
Not reported	19	5	0	4	0	3	0	2	0	0	0
Age group											
Senior	40	9	0	7	0	4	0	4	0	5	0
Pre-senior	19	3	0	2	0	3	0	3	0	3	0
Not reported	10	1	0	1	0	1	0	0	0	0	0
Player /coach											
Total	4	4	3	3	3	3	3	3	3	3	3
Player	4	4	3	3	3	3	3	3	3	3	3
Coach	1	0	0	0	0	0	0	0	0	0	0
Elite	1	1	1	1	1	1	1	1	1	1	1
High level	0	0	0	0	0	0	0	0	0	0	0
College	2	0	0	0	0	0	0	0	0	0	0
Recreational	0	0	1	0	1	0	0	0	0	0	0
Retired	0	0	0	0	0	0	0	0	0	0	0
Not reported	1	2	1	2	1	2	1	1	2	1	2
Age group											
Senior	4	3	1	1	1	3	1	3	1	3	1
Pre-senior	0	1	0	0	1	0	1	0	1	0	1
Not reported	0	1	2	2	2	0	2	0	0	0	0
Player /coach											
Total	3	2	2	2	2	2	2	2	2	2	1
Player	3	2	2	2	2	2	2	2	2	2	1
Coach	0	0	0	0	0	0	0	0	0	0	0
Elite	3	1	1	1	0	1	0	1	0	1	1
High level	0	0	0	0	0	0	0	0	0	0	0
College	0	0	0	0	0	0	0	0	0	0	0
Recreational	1	0	0	0	1	0	0	0	0	0	0
Retired	0	0	0	0	0	0	0	0	0	0	0
Not reported	0	1	1	1	0	1	0	1	0	1	0
Age group											
Senior	3	1	2	2	2	1	1	1	1	1	1
Pre-senior	1	0	0	0	1	0	1	0	0	0	0
Not reported	0	1	0	0	0	0	0	0	0	0	0
Player /coach											
Total	1	1	1	1	1	1	1	1	1	1	1
Player	1	1	1	1	1	1	1	1	1	1	1
Coach	0	0	0	0	0	0	0	0	0	0	0
Elite	0	0	0	1	0	0	0	0	0	0	0
High level	0	0	0	0	0	0	0	0	0	0	0
College	0	0	0	0	0	0	0	0	0	0	0
Recreational	0	1	0	0	0	0	0	0	0	0	0
Retired	0	0	0	0	0	0	0	0	0	0	0
Not reported	1	0	0	0	0	0	0	0	0	0	0
Age group											
Senior	0	0	1	1	1	1	1	1	1	1	1
Pre-senior	0	0	0	0	0	0	0	0	0	0	0
Not reported	1	1	0	0	0	0	0	0	0	0	0

Figure 8. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Perceptual and cognitive (P&C) abilities/skills.

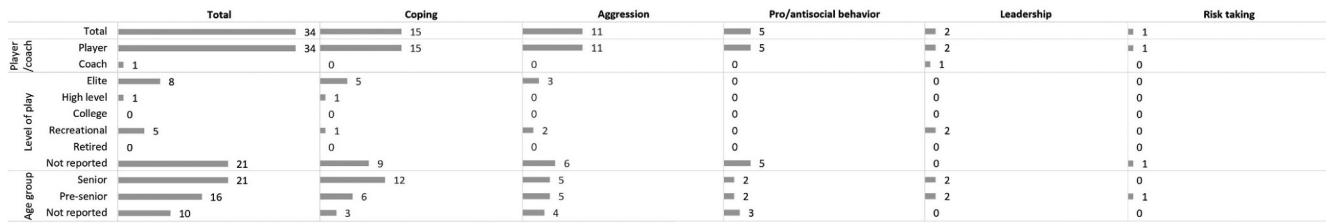


Figure 9. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Player strategies/behaviors.

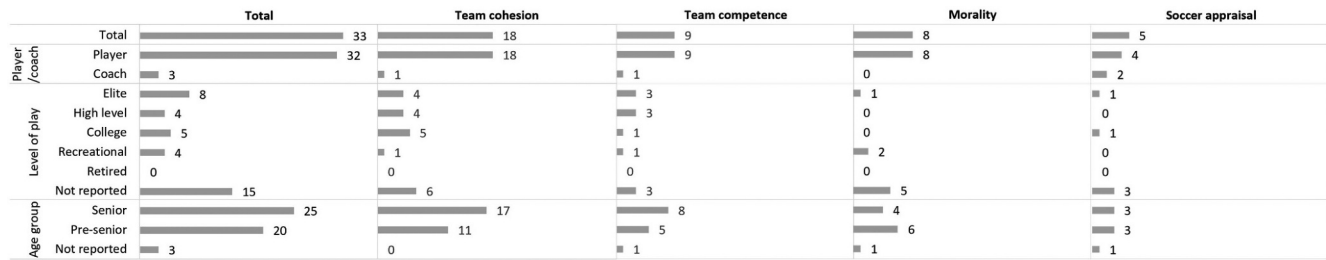


Figure 10. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Attitudes.

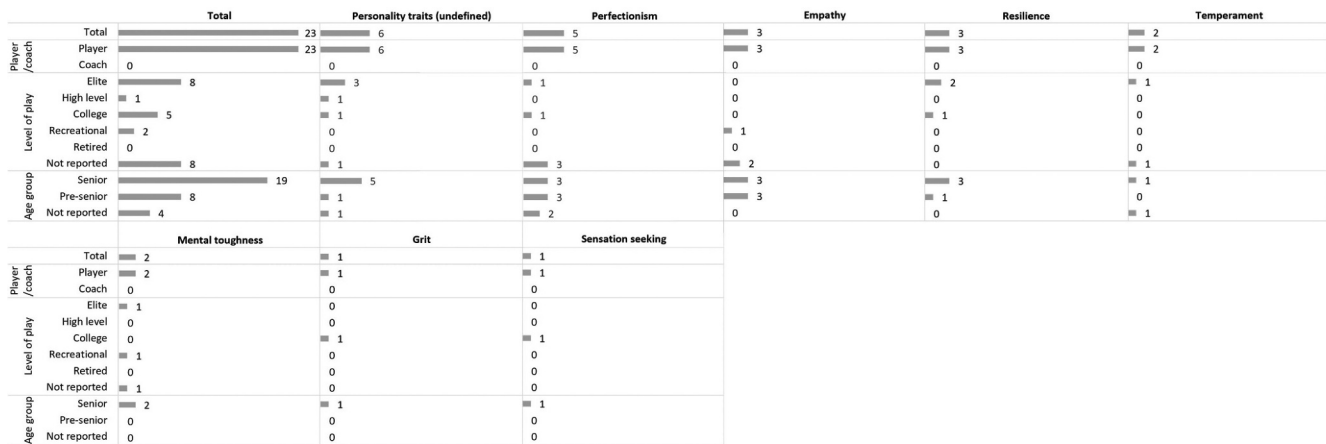


Figure 11. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Personality traits.

from different research categories (two categories, $n = 15$; three categories, $n = 4$; four categories, $n = 4$; five categories, $n = 5$). The overall population characteristics for the research category Attitudes and the population characteristics for each specific research topic within this category are presented in Figure 10.

Personality traits

The research category Personality traits contained 23 articles and eight different research topics. Personality traits (undefined) was the most common topic ($n = 6$), followed by, Perfectionism (undefined; $n = 5$), Empathy ($n = 3$), Mental toughness ($n = 2$), Temperament ($n = 2$), Resilience ($n = 2$), Grit ($n = 1$), and Sensation seeking ($n = 1$). In 13 studies, multiple research topics (two topics, $n = 3$; three topics, $n = 4$; four topics, $n = 2$; five topics, $n = 3$; ten topics, $n = 1$) from several research categories (two categories, $n = 5$; three categories, $n = 5$; four categories, $n = 3$) were covered.

Figure 11 presents the overall population characteristics and the population characteristics for each research topic within the research category Personality traits.

Other

The final research category, Other, comprised 14 articles that were coded into the three research topics Cognitive load ($n = 8$), Influence of performance evaluation ($n = 4$), and Cognitive state (undefined; $n = 2$). Ten of these studies examined multiple research topics (two topics, $n = 3$; three topics, $n = 1$; four topics, $n = 2$; five topics, $n = 4$) across several research categories (two categories, $n = 3$; three categories, $n = 1$; four categories, $n = 3$; five categories, $n = 3$). The overall population characteristics, as well as the population characteristics per research topic within the research category Other are reported in Figure 12.

		Total	Cognitive load	Influence of performance evaluation	Cognitive state (undefined)
Player /coach	Total	14	8	4	2
	Player	14	8	4	2
Level of play	Coach	0	0	0	0
	Elite	4	2	1	1
	High level	1	1	0	0
	College	1	0	0	1
	Recreational	3	2	1	0
	Retired	0	0	0	0
	Not reported	7	4	3	0
Age group	Senior	8	3	3	2
	Pre-senior	3	0	2	1
	Not reported	6	5	1	0

Figure 12. Total number of publications, as well as number of publications per research topic and population characteristic, within the research category Other.

Discussion

The aim of this review was to scope the available peer-reviewed FIFA language literature on psychology within women's soccer. In total, 280 studies, published between 1979 and 2023, were coded into specific research topics and broader research categories. Furthermore, population characteristics within each topic and category, as well as overall publication trends, were identified.

Overall publication tendencies

In line with the publication trends reported for all research within women's soccer (Okholm Kryger et al. 2021), the publication rate for studies covering psychological-related topics notably increased between 2003 ($n=3$) and 2004 ($n=9$). This increase in yearly publications could potentially be explained by researchers 'catching up' with the public interest in the FIFA Women's World Cup that were held in USA – the country with the highest number of registered players, employees, and media coverage within women's soccer (FIFA 2014, 2019) – in September-October 2003. Similar publication tendencies could be seen around the FIFA Women's World Cup years of 2011 (Germany), 2015 (Canada), and 2019 (France). A peak in number of yearly publications was noticed in 2022 ($n=43$), which is a substantial increase, compared to the previous peak in 2020 ($n=26$). It is possible that the UEFA Women's Euro that England hosted in July 2022 – a tournament that broke all-time records in terms of attendances and media coverage (Union of European Football Associations 2022) – contributed to increased attention to women's soccer from psychology researchers.

Overall population characteristics

With regard to population characteristics, 98% of the studies within this review examined players, whereas coaches were investigated in 8% of the studies. Most studies targeted players and/or coaches within senior soccer (70%), while fewer studies focused on pre-senior soccer (38%). Elite soccer was the most prevalent level of play reported (31%), followed by college soccer (13%), recreational soccer (12%), high-level soccer (6%), and retired players (<1%). The relatively high representation of senior elite players reported concur with the population characteristics in the research

on all topics within women's soccer reported by Okholm Kryger et al. (2021). However, it is important to notice that 20% of the abstracts reviewed in the current study did not provide sufficient information about the age levels of the populations examined and sufficient information about level of play of the population examined was lacking in 41% of the. This lack of information needs to be accounted for when reviewing the level of representation within the literature. Leaving out essential information about population characteristics makes it difficult for readers to easily review the relevance of the article in relation to the information they are searching for. Future research is, therefore, recommended to report details about age and playing levels of the populations studied within the abstract of the article.

Research focus

The research focus of the included studies in this review proved to be heterogeneous. In total, 75 specific research topics were identified and coded into nine broader research categories. More than half of the studies examined several research topics (56%), whereof which 69% covered topics from different research categories.

Most studies (37%) covered topics relating to any long- or short-lived emotional states and/or affective responses to a specific matter or event, followed by research topics related to contextual and interpersonal factors in a player's local soccer environment (23%), one's description and/or evaluation of oneself (23%), one's performance motives/beliefs (20%), perceptual and cognitive abilities/skills (19%), player strategies/behaviors (12%), attitudes (12%), and personality traits (8%). Five percent of the studies covered topics that did not fit within any of the other research categories.

The three most common research topics were Anxiety (17%), Stress (13%), and Coach behavior/relation (13%). The dominance of these topics is not surprising given the high prevalence of potential anxiety and stress provoking factors associated with coach and leadership behavior/the relationship between coaches and athletes within senior college- and elite-level sport (i.e., the dominant soccer populations of the studies included in this review). For example, perceived lack of coaching support, insufficient coaching competence, inadequate leadership styles, and pressure to perform including selection procedures have been identified as coach related sources to elevated anxiety and stress levels within these populations.

Another reason to the prevalence of these research topics within the literature is their relevance to both sport-specific performance and the mental health among athletes (Arnold et al. 2016; Rachel; Arnold and Fletcher 2012; Cho et al. 2019).

Previous reviews have highlighted the important role of several factors related to one or more research topics covered in this review when trying to explain and predict participation, performance, and health outcomes among soccer players and practitioners. Examples of this are the relationships between personality traits, stress, and the risk for burnout (Smith et al. 2020), skill-based differences in various perceptual and cognitive skills (Kalén et al. 2021), and the impact of various motivational and self-appraisal factors on players' decision to continue or discontinue within the sport (Back et al. 2022). However, previous research has predominantly included samples from male soccer, and it has been questioned how well these findings may apply to women (Okholm Kryger et al. 2021). Thus, in order to provide a more accurate understanding of psychological phenomena within women's soccer, future research needs to address specific research questions with a greater focus on the women's side of the game.

It is worth highlighting the ambiguity associated with the definition of research topics and allocation topics to different research categories. The definitions of research topics (see Appendix 2) were mainly adapted from the APA Dictionary of Psychology (American Psychology Association, n.d.) and refined by the authors to fit the broad scope of the current review. As such, the definitions and categorization of research topics is naturally subjective. We believe that the definitions and categorization employed in the current study are transparently reported and sufficient for the broad focus of the review. However, in future works with different scopes and/or when targeting more specific research questions, we appreciate that several topics could be differently categorized and/or split into more specific sub-topics.

Limitations

We searched five databases and scoped for peer-reviewed studies written in English, French, German, or Spanish. These were the only official FIFA languages by the date of the literature search (i.e., 18 January 2022). However, since 31 March 2022, Arabic, Portuguese, and Russian are also recognized as official FIFA languages (Fédération Internationale de Football Association 2022). Given that the popularity of women's soccer has rapidly grown around the globe, a more comprehensive literature search, including literature languages written in all official FIFA languages, would provide a more representative depiction of the volume of literature across cultures. Another limitation of this scoping review is that it was limited to peer-reviewed journal articles. Future reviews could take into account book chapters and grey literature as those might offer additional insights into psychology-related research within women's soccer. Furthermore, studies that were not retrievable from the five databases used in this study are not included in this study and that abstracts that did not provide information about sport

and/or the sex of the population studied were excluded during the screening process. This may have resulted in relevant literature not being identified during the literature search or excluded in the screening process. Finally, the first author manually extracted information from the results of the literature search and inductively coded articles into research topics and categories. Even though the first and last author met regularly to discuss uncertainties throughout these procedures, the data screening and coding processes may have been influenced by some level of researcher bias.

Conclusions

This study is the first to scope peer-reviewed literature on all psychology-related topics within women's soccer. A total of 280 studies, published in 124 different journals between 1979 and 2023, were coded into 75 specific research topics and nine broader research categories. Continuous growth in research attention has been seen over the last two decades, with extra attention around the FIFA Women's World Cup competition years and the most recent UEFA Women's Euro. Senior elite players were the most common population studied, but a notable number of abstracts did not contain sufficient details about population age and/or playing levels, leaving a high-underepresented value regarding important population characteristics of the research included in this review. The main research focus concerned topics relating to emotions, moods and/or environmental factors, where the topics anxiety, stress, and coach behavior received most research attention. Most studies examined several topics from different research categories. This scoping review gives an overview of the current state of psychology-related research within women's soccer, which may be used to guide the focus of future research questions within this multifaceted, diverse, and growing area of research.

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Data pertaining to the articles included in the review are available from the corresponding author, N. Viktor Gredin, upon reasonable request.

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