# Injury Risk Assessment in Women's Football: Are We on the Right Path to Reduce Injury Risk? A Preliminary Systematic Scoping Review

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Abstract: Elite women's football has experienced exponential growth, accompanied by an increasing in physical demands and a simultaneous shift in injury patterns. This scoping systematic review synthesised the methodologies employed in multicomponent screening tests (MCST) designed to mitigate injury risk among professional and semi-professional female players. Searches were conducted in PubMed/MEDLINE, Scopus and Web of Science (from inception in July 2024 to June 2025). Included studies were quantitative studies conducted on female soccer players. Main outcomes were functional screening profiles. Screening, data extraction, and quality assessment (Quality Assessment Tool for Quantitative Studies and the Oxford Levels of Evidence scales) were performed. Methods and results were reported according to PRISMA guidelines. The search yielded 4742 articles, of which 8 were included. Overall methodological quality of the studies was *strong*, with a *moderate* level of evidence. MCST protocols assessed mobility, lower-limb strength, core stability, jump mechanics and sprint mechanics, yet displayed considerable heterogeneity in instrumentation, metrics and cut off values. Despite growing interest, no universal protocol or consensus has yet emerged, hampering cross-study comparison and the formulation of robust injury preventive strategies for elite women's football.

## 1 INTRODUCTION

Women's football has experienced exponential growth in global popularity and professionalization, accompanied by increasing physical demands in training and competition (Emmonds et al., 2019; FIFA, 2019; Intxaurbe et al., 2025; Ruiz-Rios et al., 2024).

In recent years, increases in match-related physical demands, such as sprint distance (29%) and the distance covered at high-speed running (HSR) (15%) have been well documented in elite level female players (FIFA, 2019). This coincides with a shift in the predominant types of injuries observed. Injury surveillance data describes thigh muscle injuries to have become increasingly prevalent, with hamstring strains (12.4%), ranking as the second most common injury after ankle sprains (13.9%)(Horan et al., 2021; Intxaurbe et al., 2025; Ruiz-Rios et al., 2024).

Injury incidence in female footballers was 5.6 injuries per 1000 hours: 3.2–3.5 during training and 19.1–19.2 during matches (Hallén et al., 2024; López-Valenciano et al., 2021), slightly lower than in men (5.7 total; 3.3 training; 19.5 matches). However, the overall injury burden is greater in female players, primarily due to increased injury severity (Álvarez-Zafra et al., 2021; Ruiz-Rios et al., 2024). As such,

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injury risk reduction is a key priority but remains limited in elite women's football.

Injury risk assessment through physical-functional screening (e.g., Multicomponent Screening Tests – MCST) (Cooke et al., 2025) is a key component to implement injury risk reduction strategies (Brumitt et al., 2018; Gabbett, 2016). However, current well-founded methodologies for MCST assessment (Ruiz-Rios et al., 2024) are unclear making it essential to establish consensus protocols based on best evidence to effectively reduce injury risk and respond to the evolving demands of the women's game.

The MCST aims to provide a comprehensive physical-functional evaluation by integrating multiple assessments of capabilities related to injury risk (Álvarez-Zafra et al., 2021; Jauhiainen et al., 2022; A Östenberg & Roos, 2000). Different protocols have been implemented in real on-field practice in elite female footballers (Álvarez-Zafra et al., 2021; FIFA, 2019; Jauhiainen et al., 2022; A Östenberg & Roos, 2000). MCST protocols typically assess lower-limb mobility (Álvarez-Zafra et al., 2021; Jauhiainen et al., 2022; A Östenberg & Roos, 2000) and functional strength (Álvarez-Zafra et al., 2021; Jauhiainen et al., 2022; A Östenberg & Roos, 2000), abdomino-lumbopelvic (CORE) stability (Álvarez-Zafra et al., 2021) and jumping and sprinting biomechanics (Álvarez-Zafra et al., 2021; Jauhiainen et al., 2022; A Östenberg & Roos, 2000).

Despite the growing body of evidence linking MCST to injury risk, measurement protocols and applied methodologies, a scoping synthesis of current MCST methods is needed to resolve methodological discrepancies, consolidate best practices, and develop standardized MCST-based injury risk screening protocols for elite women's football.

Given the rapid evolution of women's football (Emmonds et al., 2019; FIFA, 2019), and as highlighted by others (Nassis et al., 2021; Ruiz-Rios et al., 2024), a comprehensive methodological consensus is urgently needed for the implementation of on-field MCST best practices aimed at reducing injury risk in female elite football. Therefore, this systematic scoping review aims to provide an exploration and a detailed synthesis of the available research methodological description concerning the MCST in elite female football players. This review may help establish a basis for future research, clarify inconsistencies, and support the development of standardized injury prevention protocols.

# 2 MATERIALS AND METHODS

## 2.1 Information Sources and Search Strategy

This systematic scoping review was reported in accordance with the PRISMA-ScR (Preferred Reporting Items for Systematic Review and Meta-analyses extension for Scoping Reviews) guidelines. Systematic searches were performed in three electronic databases (PubMed/Medline, Scopus and Web of Science) using the search the terms and keywords detailed in *Table 1.*

The initial search was conducted from inception on July 21 to July 29, 2024. No restrictions regarding the date of publication, or any other aspect, were imposed. Updated searches were performed in June 16 to June 23 (2025) to ensure the inclusion of the latest studies.

## 2.2 Inclusion and Exclusion Criteria

Manuscripts published in English and meeting PICOS-based eligibility criteria (Page et al., 2021) were included for article selection. The criteria were defined as follows: Participant (P): semi-professional and/or professional female football players based on the classification of performance calibre described by McKay et al.;(McKay et al., 2022) Intervention (I): football and/or soccer; Comparison (C): with or without control or comparison group; Outcome (O): multicomponent screening test (MCST); Study Design (S): observational descriptive or interventional, cross-sectional or longitudinal, prospective or retrospective, articles, not systematic reviews.

The exclusion criteria were men or mixed sample study, women's recreational soccer and/or football, or other sports, animals, studies reporting less than two measures of MCST, articles written in languages other than English.

Table 1: Search strategy for each database.

| Database | Search Strategy | Results (n) |
|---|---|---|
| PUBMED | ((female [MeSH] OR femal* [Title/Abstract] OR women* [Title/Abstract] OR woman* [Title/Abstract]) AND (soccer [MeSH] OR Football* [Title/Abstract] OR soccer* [Title/Abstract]) NOT (American Football OR Australian Football)) AND ((assess* [Title/Abstract] OR function* [Title/Abstract] OR evaluat* [Title/Abstract] OR test* [Title/Abstract] OR screen* [Title/Abstract]) AND (CORE* [Title/Abstract] OR Stabil* [Title/Abstract] OR “Range of Motion” [Title/Abstract] OR “ROM” [Title/Abstract] OR Stren* [Title/Abstract] OR Biomec* [Title/Abstract] OR jump* [Title/Abstract] OR sprint* [Title/Abstract] OR mechani* [Title/Abstract])) AND (Injur* [Title/Abstract] OR lesion* [Title/Abstract] OR risk* [Title/Abstract] OR incid* [Title/Abstract])) | 412 |
| SCOPUS | TITLE-ABS-KEY ( wom?n* OR femal* ) AND TITLE-ABS-KEY ( soccer* OR football* AND NOT american football OR australian football ) AND TITLE-ABS-KEY ( assess* OR test* OR evaluat* OR screen* OR function* OR "CORE" OR Stabil* OR "Range of Motion" OR "ROM" OR Strength* OR biomechanic* OR mechanic* OR jump* OR sprint* OR endur* OR aerob* ) AND TITLE-ABS-KEY ( injur* OR lesion* OR risk* OR incid* ) | 3.563 |
| WEB OF SCIENCE | (TI=("woman") OR AB=("woman") OR TI=(women*) OR AB=(women*) OR TI=(female*) OR AB=(female*)) AND (KP=("football") OR KP=("soccer") OR TI=(soccer*) OR AB=(soccer*) OR TI=(football*) OR AB=(football*)) NOT (TI=(“american football”) OR AB=(“american football”) OR TI=(“australian football”) OR AB=(“australian football”)) AND (TI=(assess*) OR AB=(assess*) OR TI=(evaluat*) OR AB=(evaluat*) OR TI=(function*) OR AB=(function*) OR TI=(test*) OR AB=(test*) OR TI=(screen*) OR AB=(screen*)) AND (TI=(“CORE”) OR AB=(“CORE”) OR TI=(Stabil*) OR AB=(Stabil*) OR TI=(“Range Of Motion”) OR AB=(“Range Of Motion”) OR TI=(“ROM”) OR AB=(“ROM”) OR TI=(Strength*) OR AB=(Strength*) OR TI=(biomechanic*) OR AB=(biomechanic*) OR TI=(jump*) OR AB=(jump*) OR TI=(sprint*) OR AB=(sprint*) OR TI=(mechanic*) OR AB=(mechanic*)) AND (TI=(injur*) OR AB=(injur*) OR TI=(lesion*) OR AB=(lesion*) OR TI=(risk*) OR AB=(risk*) OR TI=(incid*) OR AB=(incid*)) | 767 |

## 2.3 Study Selection Process and Data Extraction

All records retrieved from the databases were exported to Rayyan Intelligent Systematic Review Software (QCRI 0.1.0), where duplicates were automatically removed. Three researchers (AIG, IS and IGT) independently screened titles and abstracts to identify studies potentially meeting the inclusion and exclusion criteria. These same researchers screened the full-text versions of the selected studies based on the eligibility criteria. Inconsistencies were resolved through mutual agreement. Reference lists for all the included studies were finally reviewed to ensure no studies were missing.

Data extraction from included studies was collected by the first author (AIG) on a self-customized Excel spreadsheet. This process was independently performed by another researcher (IGT) to avoid missing data and supervised by a third author (IS). Extracted data included: authors and year of publication, participants’ sample size and performance calibre according to McKay et al.,(McKay et al., 2022) aim of the study, study design, assessed measurements, and further methodological characteristics.

## 2.4 Synthesis of Results

Studies were charted based on common topics and themes: population characteristics (i.e., anthropometric measurements, semi-professional and/or professional female football players), components of the MCST (i.e., mobility, strength, CORE, jumping and/or sprinting biomechanics), and the type of outcomes measured (i.e., MCST in relation to the injury risk).

## 2.5 Study Risk-of-Bias Assessment

The methodological quality of the included studies was assessed by 2 researchers (AI and IGT) using the Quality Assessment Tool for Quantitative Studies (Thomas et al., 2004). This tool, employed in descriptive systematic reviews on sports performance (Oja et al., 2011; Ruiz-Rios et al., 2024), is composed by 6 criteria: 1) selection bias, 2) study design, 3) confounders, 4) blinding, 5) data collection methods, and 6) withdrawals. Each criterion was rated on a scale of 1 to 3, based on specific questions related to each section, using the Quality Assessment Tool dictionary (Thomas et al., 2004). Once all components were rated, the methodology of the studies was classified as strong, moderate, or weak based on a global rating using the Quality Assessment Tool dictionary (Thomas et al., 2004).

### 2.6 Certainty Assessment

The 2011 Oxford Centre for Evidence-Based Medicine Levels of Evidence (Howick et al., 2011) (LoE) scale was employed to determine the level of evidence presented in the included studies. Two researchers classified the studies into levels ranging from 1 (highest LoE) to 5 (lowest LoE).

## 3 RESULTS

### 3.1 Study Selection

The full study selection process is detailed in *Figure 1*. A total of 4742 records were identified through database searching. After removing duplicates, 3936 remained for title and abstract screening. Of these, 394 reports were selected for retrieval. Following full-text assessments, 34 records were excluded for not meeting the inclusion criteria. In total, 8 articles were included in the review.

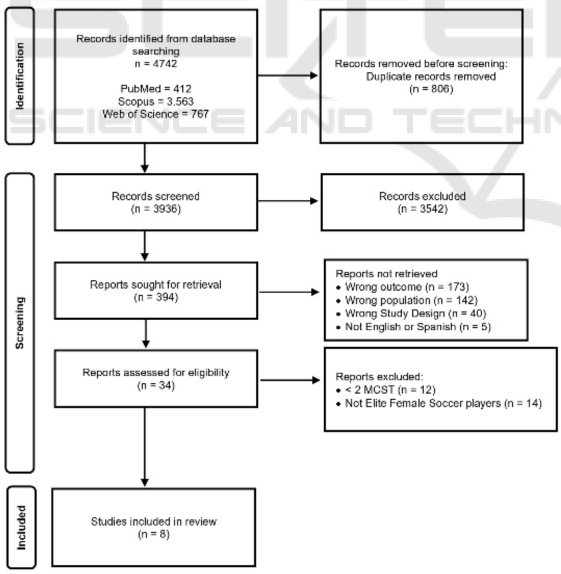


Figure 1: Flowchart showing the selection process following the Preferred Reporting Items for Systematic Review and Meta-analyses extension for Scoping Reviews.

### 3.2 Study Characteristics and Synthesis of Results

Table 2 summarises the main features of the included studies. Publication years ranged from 2000 to 2024, with the majority (Álvarez-Zafra et al., 2021; Kammoun et al., 2020; Lilić & Majkić, 2024; Poehling et al., 2021; Purdom et al., 2021; Toro-Román et al., 2023) (75%) published from 2020 onwards. Participants across the studies were elite/international level (Alexiou & Coutts, 2008; Benjamin et al., 2020; Chiaia et al., 2009; Gonçalves et al., 2021; González et al., 2024; Kammoun et al., 2020; Lilić & Majkić, 2024; Poehling et al., 2021; Purdom et al., 2021; Toro-Román et al., 2023), or highly trained/national level (Álvarez-Zafra et al., 2021; Anna Östenberg et al., 2000), female soccer players from various countries of Europe (Sweden, Spain and Serbia), North America (USA and Canada), and Africa (Tunisia). Figure 2 illustrates the descriptive characteristics of the included articles.

### 3.3 Study Selection

All studies had a *strong* global quality rating, except two studies (Benjamin et al., 2020; Purdom et al., 2021), which received a *moderate* rating (*Table 3)*. All studies were considered to have low risk selection bias, rated *strong*, indicating that participants were representative of the target population. Six studies (Álvarez-Zafra et al., 2021; Chiaia et al., 2009; Kammoun et al., 2020; Anna Östenberg et al., 2000; Poehling et al., 2021; Purdom et al., 2021) (75%) had a *moderate* study design, while two (Lilić & Majkić, 2024; Toro-Roman et al., 2023) (25%) had a *weak* design. All studies were checked for potential confounders. Due to the heterogeneity of the included studies, component 4 (blinding) was considered unsuitable for observational studies, as previously recommended (Herrero-Molleda et al., 2023; Ruiz-Rios et al., 2024). Thus, blinding criteria was deemed not applicable. All studies used valid and reliable data collection methods. Six studies (Álvarez-Zafra et al., 2021; Chiaia et al., 2009; Kammoun et al., 2020; Anna Östenberg et al., 2000; Poehling et al., 2021; Purdom et al., 2021) (75%) were level 3, and two (Lilić & Majkić, 2024; Toro-Roman et al., 2023) (25%) were level 4 on the LoE.

Table 2: Main characteristics of the studies on anthropometrical, functional and physical of female soccer players.

| Reference | Year | Participants' characteristic | Study design | Study period | Assessed measurements |
|---|---|---|---|---|---|
| Ostenberg et al | 2000 | -Female soccer players (n= 108) -First - Fifth Sweden National League -Caliber: Highly Trained and/or national Level -Country: Sweden | Observational, Cohort | Pre-season | -Anthropometric measures -Mobility: General Joint Laxity -Isokinetic -Jumping biomechanics: OLH, TJ, VJ, SH |
| Chiaia et al | 2009 | - Elite female soccer players (n= 26) -From WUSA -Caliber: Elite and/or international level -Country: United States | Observational, Cohort | Pre-season | -Anthropometric measures -Mobility: PROM, Flexibility, Dynamic functional alignament -HHD: Hip abductor strength -CORE: Stabilizer Dead Bug |
| Moncef Kammoun et al | 2020 | -Elite female soccer players (n= 75) -Form the Division 1 and 13 of them part of the national team -Caliber: Elite/international level -Country: Tunisia | Observational, Cohort | In-season | -Anthropometric measures -Mobility: Flexibility -Jumping biomechanics: CMJ -Sprint: 20m |
| Poehling et al | 2021 | -Elite female soccer players (n= 143) -Caliber: Elite and/or international level -Country: Canada | Mixed Longitudinal Observational, Cohort | NR | -Anthropometric measures -Jumping biomechanics: BJ, CMJ, SJ -Sprint: 10m, 40m |
| Purdom et al | 2021 | -Elite female soccer players (n=29) -From Division 1 -Caliber: Elite/ international level -Country: United States | Observational, Cohort | Pre-season In-season Post-season | -Anthropometric measures -Mobility: YBT, Leg Length Asymetry -Jumping biomechanics: MVP, CMJ |
| Álvarez-Zafra et al | 2021 | -Elite female soccer players (n= 22) -From Spanish Reto Iberdrola-Segunda División PRO league -Caliber: Highly Trained and/or national Level -Country: Spain | Longitudinal observational, Cohort | Entire competitive season | -Anthropometric measures -Mobility: ROM -HHD: Hamstring prone 15º, AKE, Quadriceps 90º -CORE: Prone plank, side bridge -Jumping biomechanics: DJ, UDJ, COHD |
| Toro Roman et al | 2023 | -Elite female soccer players (n= 24) -From Division 2 -Caliber: Highly Trained and/or national Level -Country: Spain | Cross-sectional, quasi-experimental | In-season | -Anthropometric measures -HHD: Hand grip, Squat Isometric strength -Jumping biomechanics: CMJ, SJ |
| Lilic | 2024 | -Elite female soccer players (n= 20) -Caliber: Elite/ international level -Country: Serbia | Cross-sectional | Pre-season | -Anthropometric measures -FMS -Jumping biomechanics:SJ, CMJ, CMJA -Sprint: 20m linear sprint, Slalom Test, zig-zag test |

Abbreviations: WUSA, Women's United Soccer Association; NCAA, National Collegiate Athletic Association; D1, First Division; MCST, Multicomponent screening test; PROM, Passive Range of Motion; YBT: Y Balance test; FMS, Functional Movement Screen; MVP, Maximal Vertical Power; CMJ, countermovement jump; CMJA, CMJ with arm swing; CoD, change-of-direction; DJ, drop jump; UDJ, Unilateral drop jump; OLH, One Leg Hop; TJ, Triple Jump; VJ, Vertical Jump; SH, Square Hop; BJ, Broad Jump; COHD, Cross over hop distance; KOOS, Knee injury and Osteoarthritis Outcome Score.

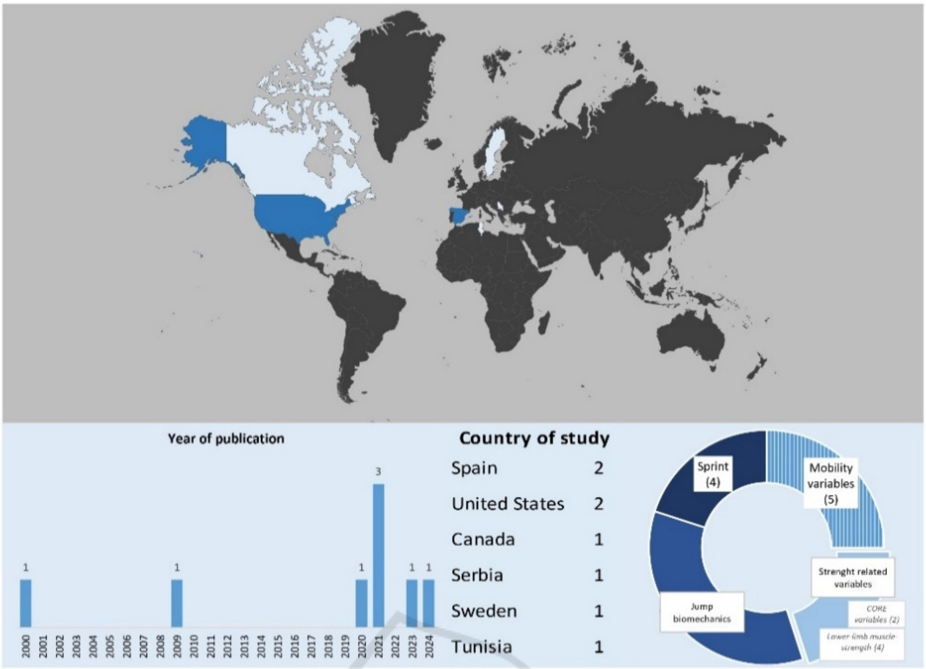


Figure 2: Graphical representation of the number of studies analysing multicomponent screening tests (MCST) in the systematic scoping review.

Table 3: Results of the Quality Assessment Scores (Global rating) and Oxford Levels of Evidence from the included studies.

| Study | Selection bias | Study design | Confounders | Blinding | Data | Withdrawal | Global rating | LoE |
|---|---|---|---|---|---|---|---|---|
| Ostenberg et al. | 1 | 2 | 1 | — | 1 | 1 | Strong | 3 |
| Chiaia et al. | 1 | 2 | 1 | — | 1 | 1 | Strong | 3 |
| Moncef Kammoun et al. | 1 | 2 | 1 | — | 1 | 1 | Strong | 3 |
| Poehling et al. | 1 | 2 | 1 | — | 1 | 1 | Strong | 3 |
| Purdom et al. | 1 | 2 | 1 | — | 1 | 3 | Moderate | 3 |
| Álvarez-Zafra et al. | 1 | 2 | 1 | — | 1 | 1 | Strong | 3 |
| Toro Roman et al. | 1 | 3 | 1 | — | 1 | 1 | Strong | 4 |
| Lilic, A. | 1 | 3 | 1 | — | 1 | 1 | Strong | 4 |

Abbreviation: LoE, levels of evidence. Note: "Data" are data-collecting methods. The quality assessment scores criteria were 1, strong; 2, moderate; 3, weak, and—, not applicable. The Oxford LoE was classified from 1, highest level, to 5, lowest level. Please see the "Methods" section for more details about the applied criteria and the assessment of both global rating and LoE.

Table 4: Main methodological characteristics of the studies in multicomponent screening test (MCST) of female soccer players.

| Reference | MCST | Examiner | Familiarization | Material | Attempts | Laterality | Reference Statistic | LSI |
|---|---|---|---|---|---|---|---|---|
| Ostenberg et al (2000) | -Mobility | -Same 3 examiners | -NR | -N/A | -NS | -Right/Left | -Summation | -NR |
| | -Isokinetic | -Same 3 examiners | -NR | -Isokinetic Dynamometer | 4 | -Right/Left | -Mean | -NR |
| | -Jumping biomechanic | -Same 3 examiners | -NR | -Measuring Tape<br>-Wood platform with a belt<br>-Tape | 3 | -NR | -Mean (One Leg Hop)<br>-Max | -NR |
| Chiaia et al. (2009) | -Mobility | -Same examiner | -NR | -Standard goniometer<br>-8 and 12 in step<br>-Grid | 3 | -Dominant /No Dominant | -Mean | -NR |
| | -HHD | -Same examiner | -NR | -HHD | 3 | -Dominant /No Dominant | -Mean | -NR |
| | -CORE | -Same examiner | -NR | -Stabilizer | 3 | -N/A | -Mean | -N/A |
| Moncef et al (2020) | -Mobility | -NR | -NR | -Standard 12 inches height box | 2 | -NR | -Max | -NR |
| | -Jumping biomechanic | -NR | -NR | -Optojump | 3 | -NR | -Max | -NR |
| | -Sprint | -NR | -NR | -NR | 2 | -NR | -Max | -NR |
| Poehling et al (2021) | -Jumping biomechanic | -Same 2 examiners | -NR | -Measuring tape and a yard stick<br>-Contact mat | 2 | -NR | -Mean | -NR |
| | -Sprint | -Same 2 examiners | -NR | -Dual beam timing lights | 2 | -NR | -NR | -NR |
| Purdom et al. (2021) | -Mobility | -NR | -NR | -FMS YBT | 3 | -Right/Left | -Mean | -cm |
| | -Jumping biomechanic | -NR | -NR | -Vertec apparatus | 3 | -NA | -Max | -NA |
| Álvarez-Zafra et al. (2021) | -Mobility | -NR | -NR | -Goniometer | 2 | -Right/Left | -Mean | -Ratio |
| | -HHD | -NR | -NR | -HD | 2 | -Right/Left | -Mean | -Ratio |
| | -CORE | -NR | -NR | -HHD | 2 | -Right/Left | -Mean | -Ratio |
| | -Jumping biomechanic | -NR | -NR | -Inertial measurement unit sensor<br>-20 and 50 cm box height<br>-Two standard video cameras<br>-Tape | 2 | -Right/Left | -Mean | -Ratio |
| Toro Roman et al. (2023) | -Jumping biomechanic | -Same examiner | -NR | -Optojump | 2 | -N/A | -Max | -N/A |
| | -HHD | -Same examiner | -NR | -Hand grip dynamometer<br>-Dynamometer | 2 | -Hand grip: Dominant | -Max | -N/A |
| Lilic A et al. (2024) | -Jumping biomechanic | -NR | -Yes | -Optojump | 3 | -N/A | -Max | -N/A |
| | -FMS | -NR | -Yes | -FMS | 3 | -Right/Left | -Summation | -N/R |
| | -Sprint | -NR | -Yes | -Photocells, infrared timing gates | 2 | -N/A | -Max | -N/A |

LSI, Limb symmetry index; NR, not reported; N/A, not applicable; NS not specified; Max, Maximal value was chosen for the analysis; Mean, Mean value was chosen for the analysis; Summation, Sum of the values were chosen for the analysis; HHD, Hand-Held Dynamometry; FMS, Functional Movement Screen.

## 3.4 Results and Synthesis of Individual Studies

### 3.4.1 Multicomponent Screening Test (MCST) Characteristics

Table 4 provides an overview of the main methodological characteristics of the included studies that assessed MCSTs.

**Mobility**
Mobility variables were included in five studies (Álvarez-Zafra et al., 2021; Chiaia et al., 2009; Kammoun et al., 2020; Lilić & Majkić, 2024; Purdom et al., 2021) (63%). Mobility was assessed using various methods, including range of motion (ROM), passive ROM (PROM), flexibility, dynamic functional alignment, sit and reach (SAR), and the Functional Movement Screen (FMS).

**Lower Limb Strength-Related Variables**
Four studies (Álvarez-Zafra et al., 2021; Chiaia et al., 2009; Anna Östenberg et al., 2000; Toro-Román et al., 2023) (50%) reported lower-limb muscle-strength variables. Three studies (Álvarez-Zafra et al., 2021; Chiaia et al., 2009; Toro-Román et al., 2023) utilised a dynamometer assessing the isometric strength of the quadriceps, hamstring, hip adductors, hip abductors and hand grip. One study employed an isokinetic test (Anna Östenberg et al., 2000), measuring knee flexors and extensors peak torque at different angles.

**Abdominal-Lumbo-Pelvic (CORE) Stability Strength**
Two studies (25%) measured the stabilization capacity of the abdominal-lumbo-pelvic complex (CORE) by isometric strength (Álvarez-Zafra et al., 2021; Chiaia et al., 2009).

**Jumping Biomechanics**
Jumping biomechanics composed by vertical and horizontal jumps were measured in seven studies (Álvarez-Zafra et al., 2021; Chiaia et al., 2009; Kammoun et al., 2020; Lilić & Majkić, 2024; Anna Östenberg et al., 2000; Toro-Román et al., 2023) (88%). Five studies (Gonçalves et al., 2021; Kammoun et al., 2020; Lilić & Majkić, 2024; Anna Östenberg et al., 2000; Toro-Román et al., 2023) used the countermovement jump (CMJ), reporting jumping height (Gonçalves et al., 2021; Kammoun et al., 2020; Lilić & Majkić, 2024; Anna Östenberg et al., 2000; Toro-Román et al., 2023) and jumping flight time.(Toro-Román et al., 2023) One study (Lilić & Majkić, 2024) measured CMJ with arm swinging reporting jumping height. Three studies used the squat jump (SJ), reporting jumping height (Gonçalves et al., 2021; Lilić & Majkić, 2024; Toro-Román et al., 2023) and flight time. (s) Two studies (Álvarez-Zafra et al., 2021; Anna Östenberg et al., 2000) measured horizontal jumps (one leg hop and triple hop and cross over hop). One study (Álvarez-Zafra et al., 2021) measured the drop jump both bilaterally (DJ) and unilaterally (UDJ). This study quantified vertical ground reaction forces (VGRFs) during landings, propulsive force, mechanical power, and kinematic record of the landing pattern. It also assessed horizontal jumping by cross-over hop distance test, measuring VGRFs at initial contact and horizontal forces. This study was the only study reporting the asymmetry index.

**Sprint Biomechanics**
Sprint variables were included in three studies (Kammoun et al., 2020; Lilić & Majkić, 2024; Poehling et al., 2021) (38%). All studies (Kammoun et al., 2020; Lilić & Majkić, 2024; Poehling et al., 2021) analysed 10m sprint; two others (Kammoun et al., 2020; Lilić & Majkić, 2024) 20m; and, another (Poehling et al., 2021) the 40m sprint. All studies reported de duration of each sprint in seconds. None of them reported any kinetic or kinematic variables of sprinting.

## 4 CONCLUSIONS

This review highlights the existing gap between physical profile of women's football and the methodological consistency required for effectively screen the injury risk in women's footballers. This review shows similar conclusions as a recent systematic review (Ruiz-Rios et al., 2024), emphasising the existing heterogeneity between MCST protocols, limiting comparability and practical applications. Given the rapid evolution of women's football (Emmonds et al., 2019; FIFA, 2019), and as highlighted by others (Nassis et al., 2021; Ruiz-Rios et al., 2024), a comprehensive methodological consensus is urgently needed for the implementation of on-field MCST best practices integrating load-sensitive metrics as well as kinetic and kinematic variables during jump- and sprint-tasks; according to the evolution that the female football is suffering. Future research must prioritise prospective longitudinal designs that concurrently track standardised MCST outcomes and injury incidence, enabling the development of validated predictive algorithms.

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