THE SPORTS SCIENCE & SPORTS MEDICINE OF NETBALL

LEEDS BECKETT UNIVERSITY

ENGLAND NETBALL

LEEDS RHINOS NETBALL

FSEMC 2022

Prof. Ben Jones

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@23benjones

THE SPORTS SCIENCE & SPORTS MEDICINE OF NETBALL

Saturday 1 October 1600-1730

Professor Ben Jones (Chair); Translating team sport research to netball

Dr Sarah Whitehead; Overview of the current sports science and medicine evidence-base in netball

Professor Christa Janse van Rensburg; Injury and illness prevention interventions for netball athletes

Anthony Clark; Fatigue and recovery in netball

Lois Mackay; The match demands of the Superleague and a consensus on physical and technical actions

Sarah Chantler; The body composition and energetic requirements of elite netballers

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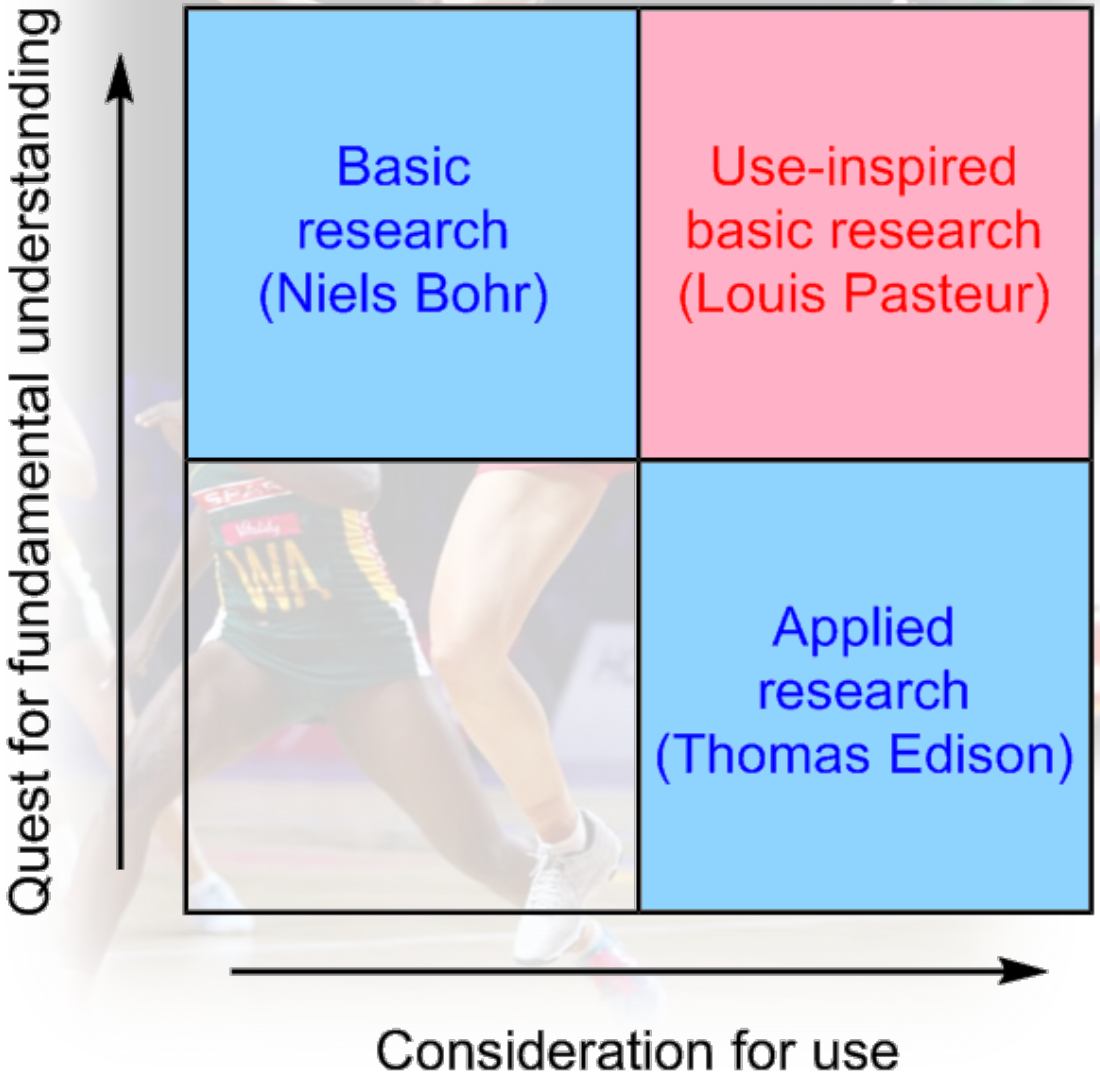
Translating team sport research to netball



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Overview of the Current Sports Science and Medicine Evidence-base in Netball

Netball Symposium

Dr Sarah Whitehead

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- Dynamic **high-intensity** intermittent court-based sport
- **Unique loading** demands – decelerations, jumps, change of direction
- **Intensified** fixture periods
- **Semi-professional**; competing demands
- Predominantly **female** athletes

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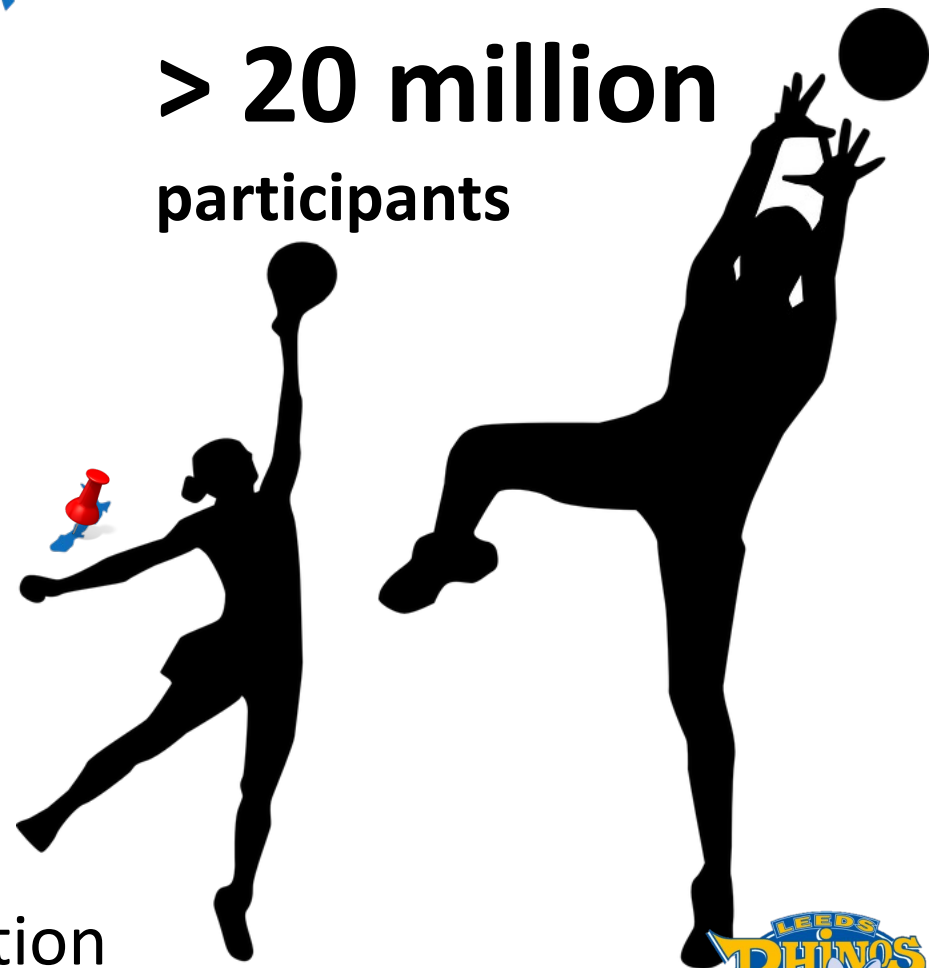
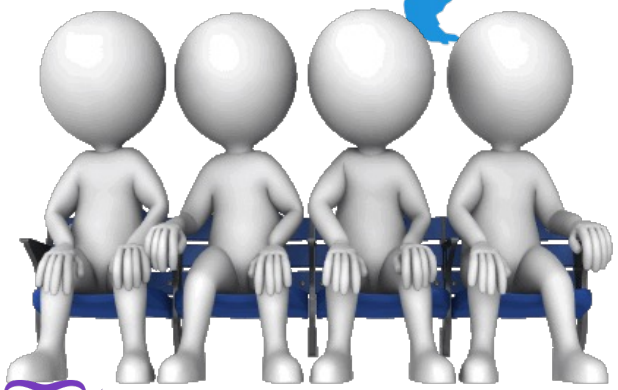
One of the most popular female sports in the world

> 20 million

participants





> 80 countries

> 70 National Netball

Associations affiliated to the International Netball Federation

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The evolution of international and professional netball:

1995

International Olympic Committee 'recognised' sport

1998

Commonwealth Games

Included in the games progamme for the first time

2008

Professional status

First semi-professional netball league; the ANZ Championship

2017

Suncorp Super Netball established

Australia's leading payment system for women's sport in 2019

2018

England win the Commonwealth games

Increased participation in the UK

2022

Netball South Africa go Professional

Contracted players for the first time

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Sports Medicine (2021) 51:1715–1731
https://doi.org/10.1007/s40279-021-01461-6

SYSTEMATIC REVIEW

The Applied Sports Science and Medicine of Netball: A Systematic Scoping Review

Sarah Whitehead[1,2,3] · Jonathon Weakley[1,4] · Stuart Cormack[5,6] · Helen Alfano[7] · Jim Kerss[8] · Mitch Mooney[5,9] · Ben Jones[1,3,10,11,12]

Accepted: 29 March 2021 / Published online: 4 June 2021

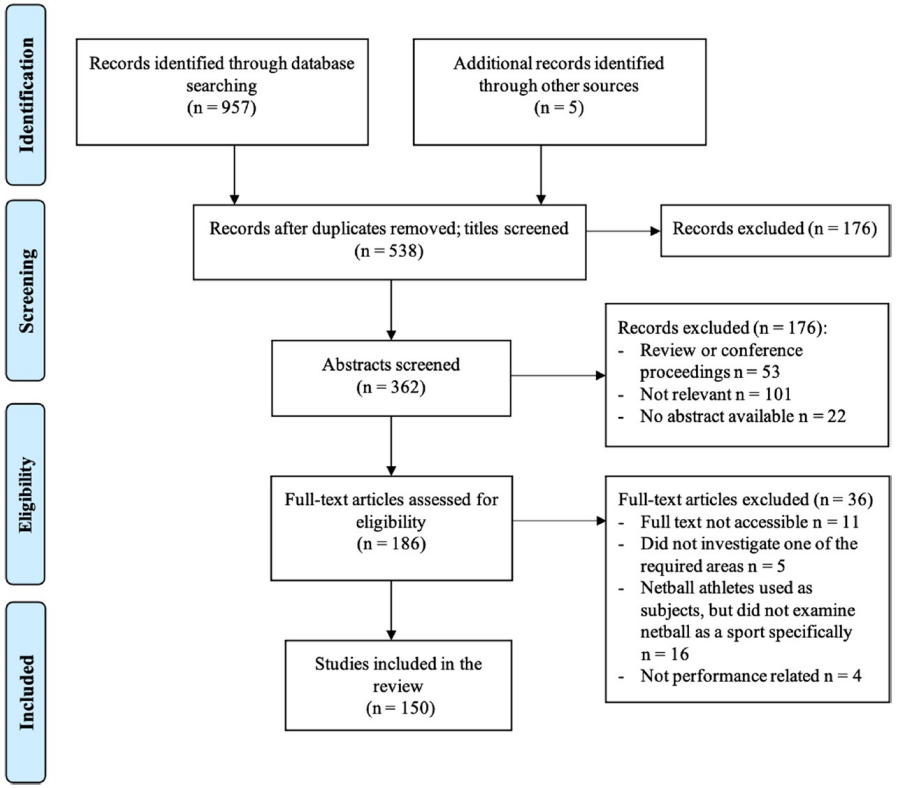

Fig. 1 Flow of selection process for eligible studies for inclusion

1) Conduct a systematic search of the published literature

2) Map out the characteristics of the research

3) Provide a brief summary of the research in each topic of sport science and medicine

4) Identify gaps in the current research

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150 studies published across 8 sports science and medicine topics

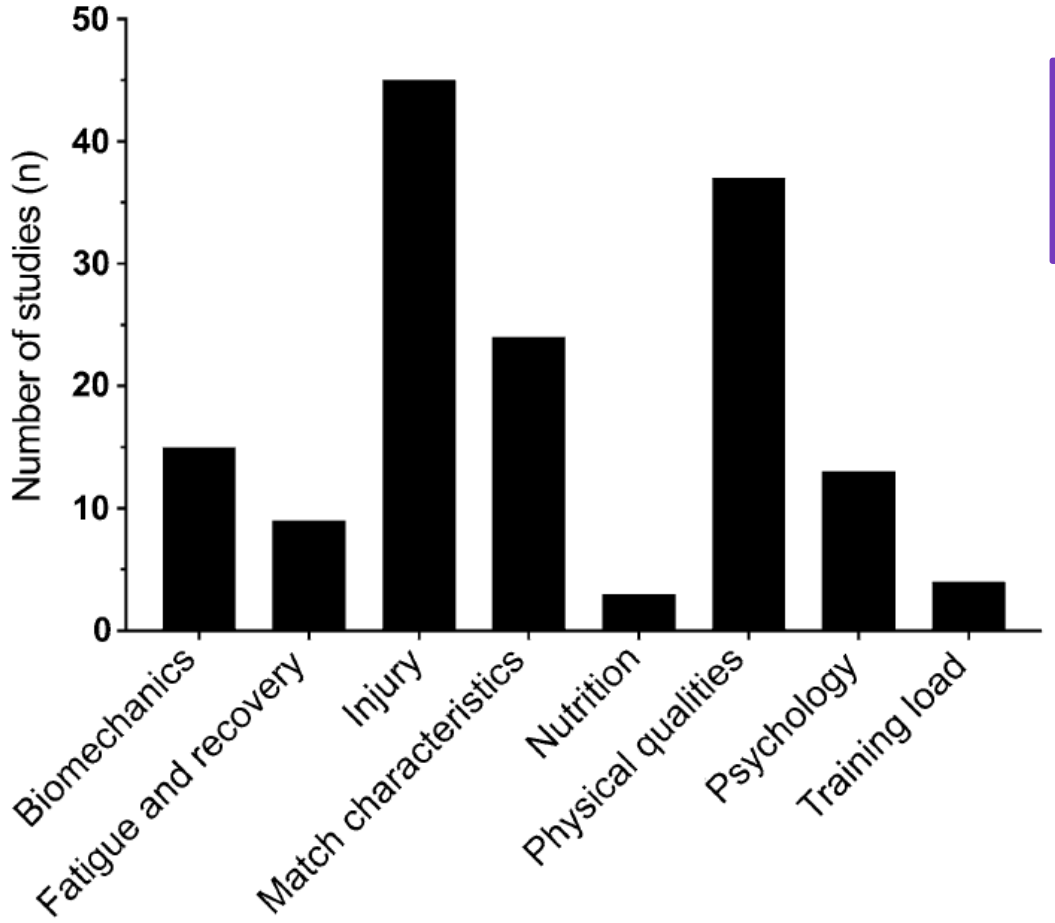

Fig. 2 Netball sport science and medicine topics of included studies

~ 32 studies since last search took place

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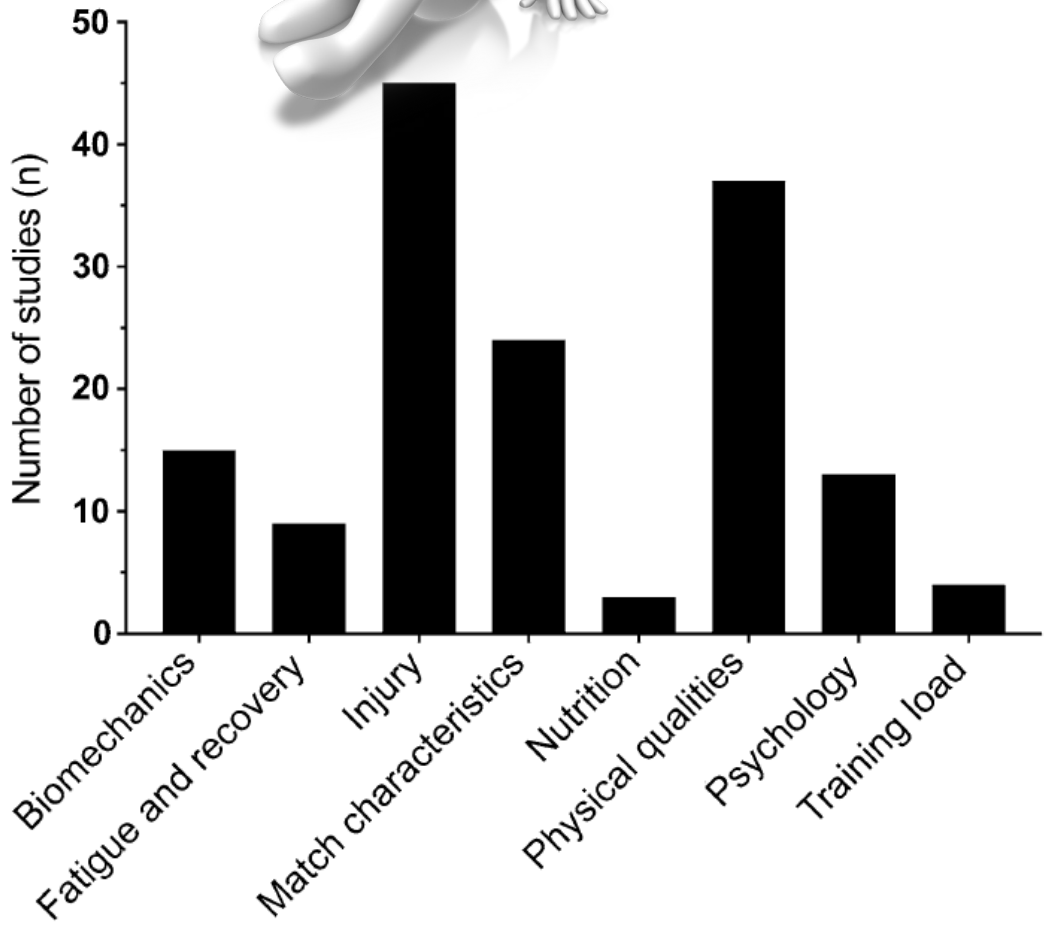
n = 45

30%



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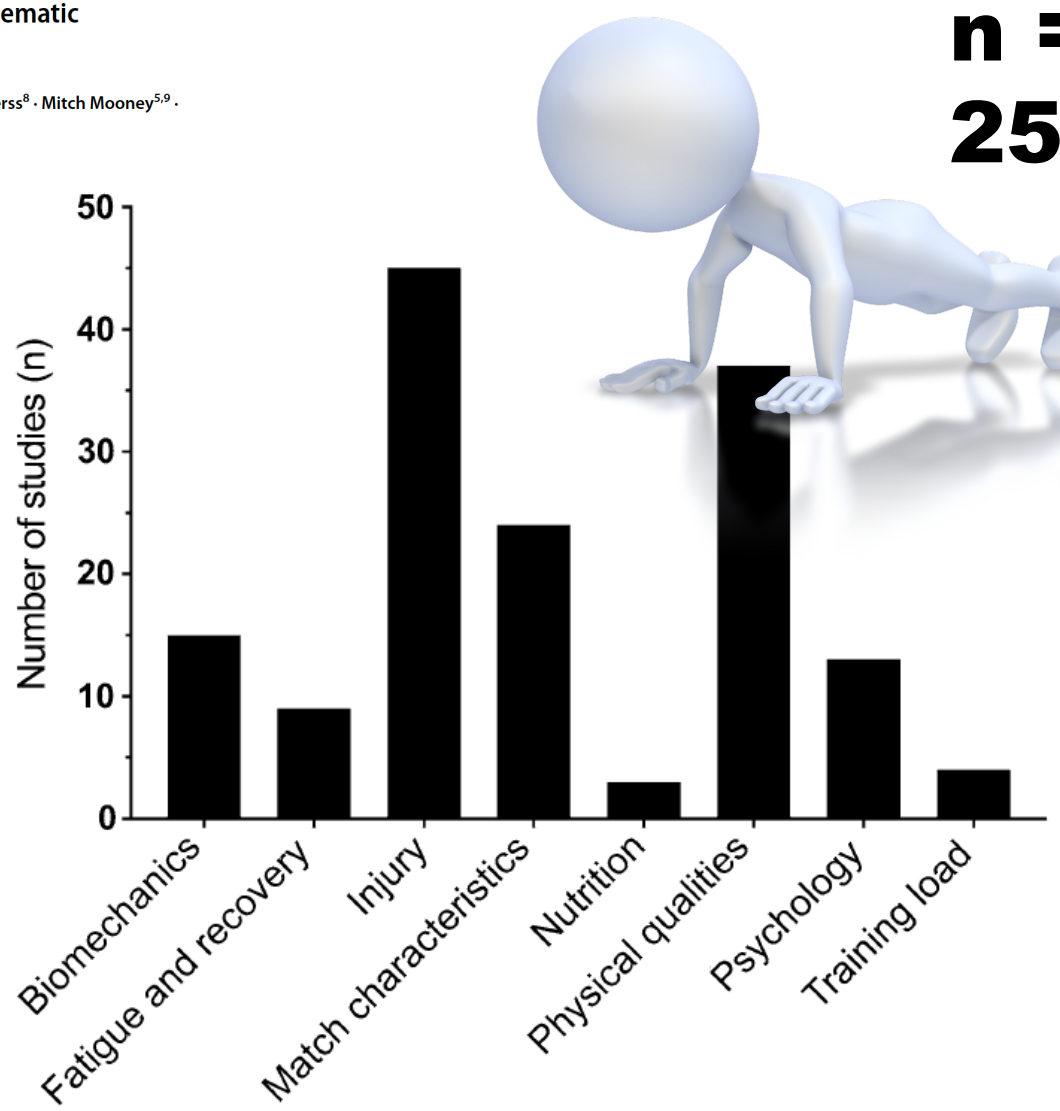
n = 37

25%



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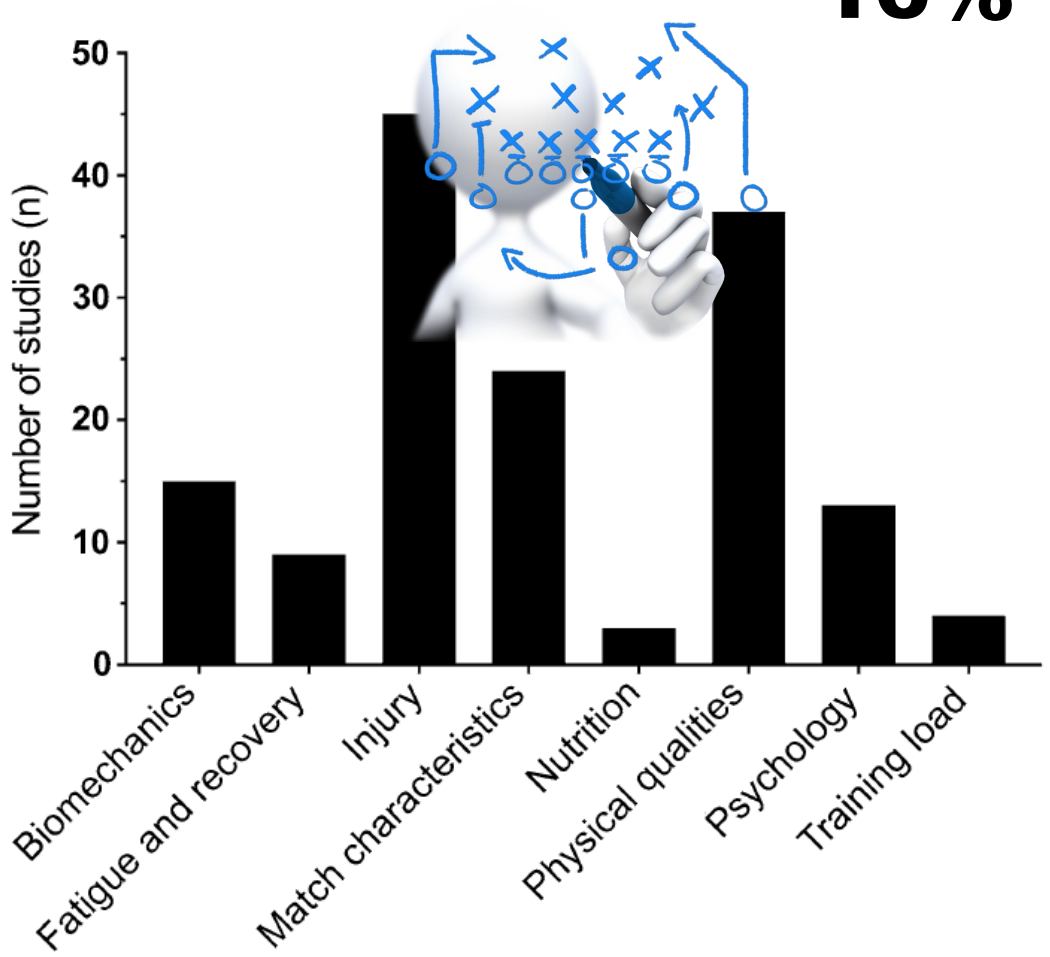
n = 24

16%



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INJURY

Injury epidemiology

Injury risk and prevention

MATCH CHARACTERISTICS

Activity profiles

Technical-tactical

Performance

FATIGUE AND RECOVERY

Mental and physiological fatigue

Sleep and wellbeing

Recovery modalities

NUTRITION

Energy intake & expenditure

Hydration

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UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Professor Christa Janse Van Rensburg

ENGLAND NETBALL

LEEDS BECKETT UNIVERSITY

Lois Mackay

LEEDS RHINOS NETBALL

LEEDS BECKETT UNIVERSITY

Anthony Clark

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Sarah Chantler

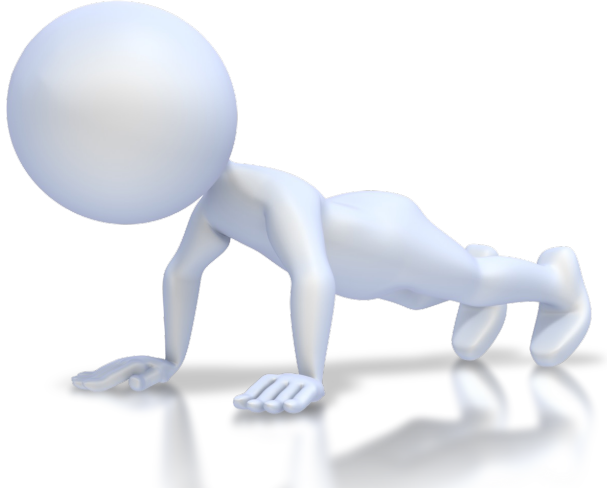
PHYSICAL QUALITIES

Physical characteristics

Anthropometrics

Interventions

Testing



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- **43%** studies focused on physical characteristics
- **Differences** in standards and positions
- **Netball specific tests:** ‘Net-Test’ & ‘Netball Movement Screening Tool’
- **NetballSmart** Dynamic Warm-up; performance and landings

JOURNAL OF SPORTS SCIENCES
2019, VOL. 37, NO. 11, 1212–1219
https://doi.org/10.1080/02640414.2018.1553269

Routledge
Taylor & Francis Group

SPORTS PERFORMANCE

Check for updates

Physical profiles of elite, sub-elite, regional and age-group netballers

Marni J. Simpson [a,b], David G. Jenkins[a], Michael D. Leveritt[a] and Vincent G. Kelly [c]

[a]School of Human Movement and Nutrition Sciences, University of Queensland, St Lucia, Australia; [b]Queensland Firebirds, Netball Queensland, Moorooka, A

A Comparison of Isometric Midthigh-Pull Strength, Vertical Jump, Sprint Speed, and Change-of-Direction Speed in Academy Netball Players

Christopher Thomas, Paul Comfort, Paul A. Jones, and Thomas Dos'Santos

Original Research

The effect of the NetballSmart Dynamic Warm-up on physical performance in youth netball players

Chloe R. McKenzie*, Chris Whatman, Matt Brughelli, Robert Borotkanics

Sports Performance Research Institute New Zealand, School of Sport and Recreation, Auckland University of Technology, Auckland, New Zealand

Original research

The test-retest reliability and criterion validity of a high-intensity, netball-specific circuit test: The Net-Test

Sean F. Mungovan [a,b,c,*], Paula J. Peralta [d,e], Gregory C. Gass [f], Aaron T. Scanlan [g]

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BIOMECHANICS

Injury risk

Movement technique

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- **80%** investigated outcomes related **to injury risk**
- **Landing** tasks
- **Strapping** and **bracing;** athlete perceived benefit
- Movement tasks: **shooting** and **shoulder pass**

Do the landing mechanics of experienced netball players differ from those of trained athletes competing in sports that do not require frequent landings?

Tyler J. Collings[a,b], Adam D. Gorman[a,c], Max C. Stuelcken[a], Daniel B. Mellifont[a], Mark G.L. Sayers[a,*]

Does ankle tape improve proprioception acuity immediately after application and following a netball session? A randomised controlled trial

Erin Smyth [a, b, *], Gordon Waddington [a, b], Jeremy Witchalls [a], Phillip Newman [a], Juanita Weissensteiner [c], Steven Hughes [d], Theo Niyonsenga [e], Michael Drew [b]

Journal of Sports Sciences, October 2010; 28(12): 1299–1307

Routledge Taylor & Francis Group

Kinematic analysis of netball goal shooting: A comparison of junior and senior players

ANNE DELEXTRAT[1] & MARK GOSS-SAMPSON[2]

[1]*School of Human Sciences, London Metropolitan University, London, UK and* [2]*School of Science, Greenwich University, London, UK*

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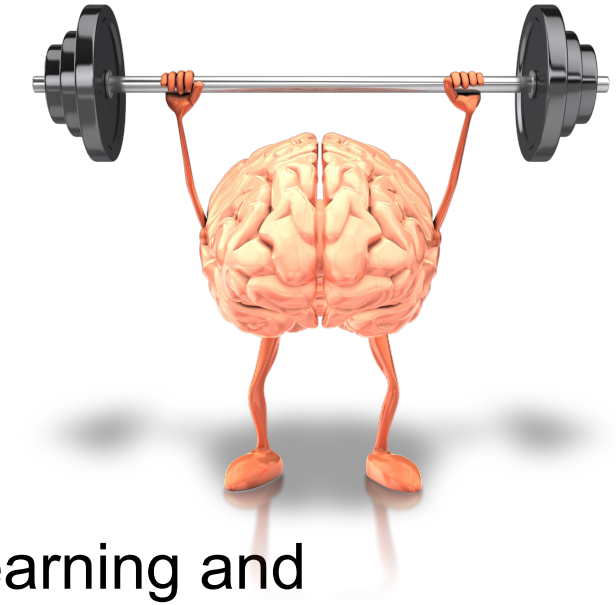
PSYCHOLOGY

Motor learning
Decision making
Psychological skills



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- **38%** studies focused on motor learning and decision making
- Decision making = **key discriminator** between skill levels
- **Stressors** in national netball athletes: academic, sport and social
- Team cohesion, imagery, communication

Exploring Coping Strategies Used by National Adolescent Netball Players Across Domains

Tracey J. Devonport, Andrew M. Lane, and Kay Biscomb
University of Wolverhampton

South African J
Suid-Afrikaanse Tydskrif vir Navorsing in Sport, Liggaamlike Opvoedkunde en Ontspanning, 2011, 33(2): 45-58
ISSN: 0379-9069

PSYCHOLOGICAL SKILLS OF PROVINCIAL NETBALL PLAYERS IN DIFFERENT PLAYING POSITIONS

Heinrich, W. GROBBELAAR* & Maryke ELOFF**

ELSEVIER
Journal of Science and Medicine in Sport 15 (2012) 361–367
Sport
www.elsevier.com/locate/jsams

Original research

How specific is domain specificity: Does it extend across playing position?

Lyndell Bruce [a,b,c,*], Damian Farrow [a,d], Annette Raynor [b,e]

Talent Development & Excellence
Vol. 2, No. 2, 2010, 123–135

A Multi-Factorial Examination of the Development of Skill Expertise in High Performance Netball

Damian Farrow*

TRAINING LOAD

External load
Internal load

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- Quantification across a **season**; positional differences
- **Metric selection**: session RPE and COD ideal combination
- Comparison of **training** to competitive **match-play**

International Journal of Sports Physiology and Performance, 2020, 15, 1385-1392
https://doi.org/10.1123/ijspp.2019-0971

Workload Differences Between Training Drills and Competition in Elite Netball

Marni J. Simpson, David G. Jenkins, and Vincent G. Kelly

Article

Physical Movement Demands of Training and Matches across a Full Competition Cycle in Elite Netball

Edward R. Brooks [1,*], Amanda C. Benson [2], Aaron S. Fox [1] and Lyndell M. Bruce [1]

International Journal of Sports Physiology and Performance, 2020, 15, 841-846
https://doi.org/10.1123/ijspp.2019-0619

Human Kinetics
ORIGINAL INVESTIGATION

Relationships Between External- and Internal-Workload Variables in an Elite Female Netball Team and Between Playing Positions

Marni J. Simpson, David G. Jenkins, Aaron T. Scanlan, and Vincent G. Kelly

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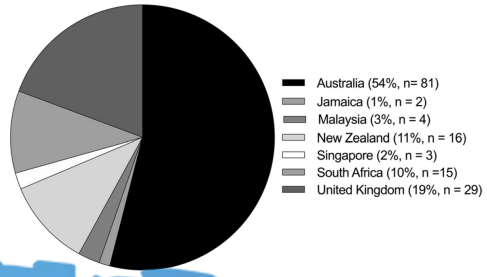
150 studies published from 7 different countries



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Check for updates

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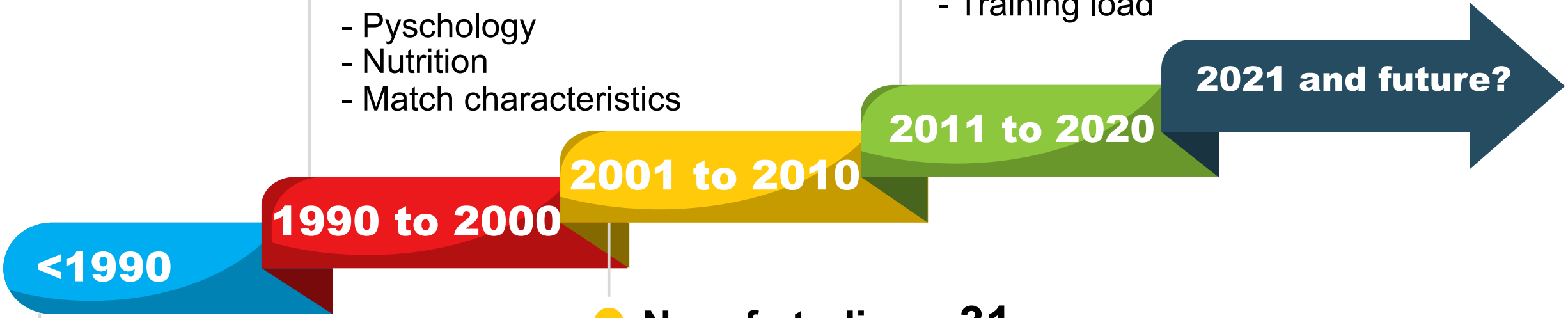
Evolution of research



No. of studies = 3

First study: 1986

No. of studies = 17

Injury n = 10, 24%

First studies in:
- Pyschology
- Nutrition
- Match characteristics

No. of studies = 31

Injury n = 12, 29%

First study in:
- Fatigue and recovery

No. of studies = 86

Physical qualities n = 23, 68%

First study in:
- Training load

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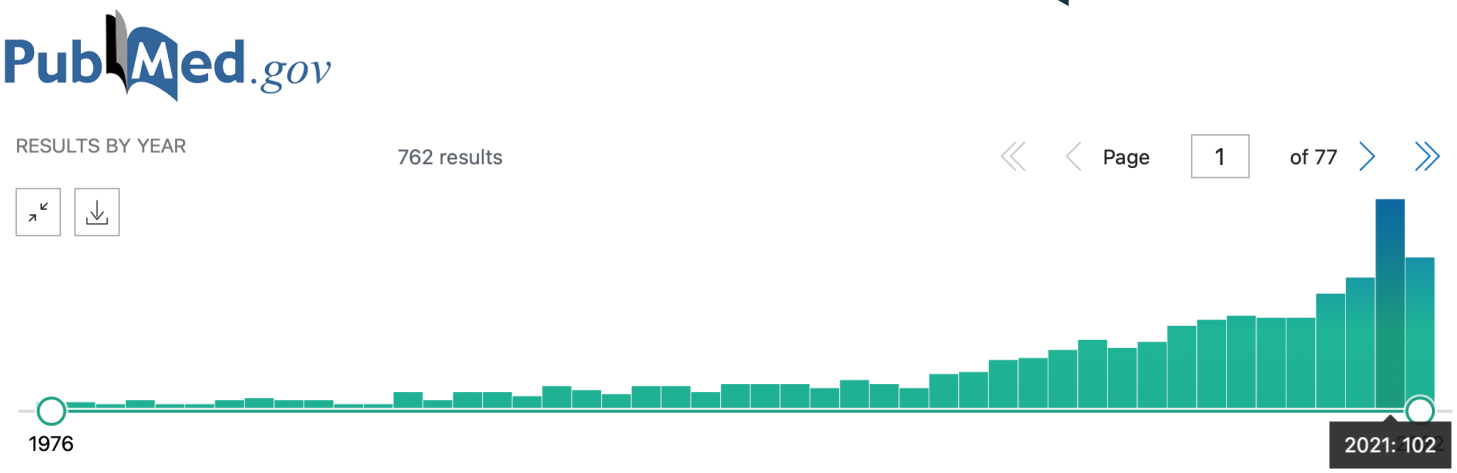
2021 and future?

~ 32 studies since last search took place



- **Technological** advancements
- More **exposure**
- Increase in **funding**
- Increase in **professionalism**
- More embedded **research-practitioners**

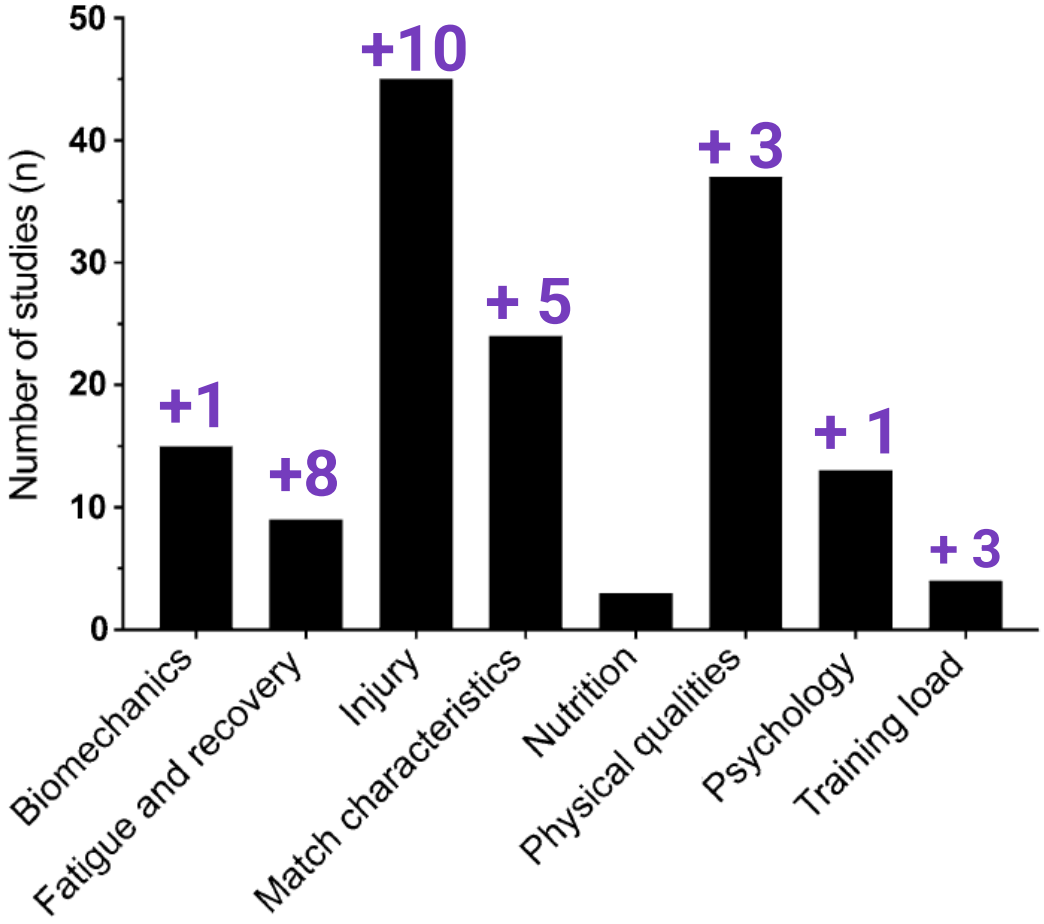


Fig. 2 Netball sport science and medicine topics of included studies

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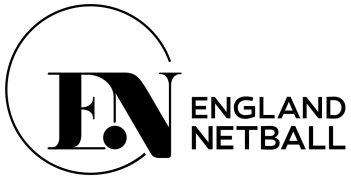
Table 2 Examples of future research directions in topics for which the current evidence base is limited or conflicting, and in topics where there is no current research

Research topic	Focus	Current evidence base		What is the clinical and practical relevance of this research? (i.e., impact on policy and practice)	What is the priority for this research to be carried out? (low/medium/high)
		Limited	Conflicting		
Current evidence base is limited or conflicting					
Biomechanics/ injury	Landing technique influence on injury risk	Yes	No	Could direct landing training programmes undertaken at all levels with potential for recommendations and coach training to infiltrate community netball	Medium
Biomechanics/ injury	Lower limb movement screening and injury risk	Yes	Yes	Any links/associations could direct effective screening content	Medium
Injury risk and influence	Role of physical capacity and other factors. Particularly with high-level athletes	Yes	Yes	Would enable a higher standard of decision making and athlete care through implementing training programmes that could mitigate/improve risk	High
Recovery	Effective recovery modalities; specifically during congested fixtures	Yes	No	Current wider research on recovery modalities are extendable to netball. Best strategies during periods of congested fixtures could benefit teams test-series or tournaments	Low
Match-play	Differences in technical-tactical characteristics between levels of play	Yes	No	Would support in directing training progressions through playing careers	Medium
Performance	Influence of fixture scheduling on individual and team performance	Yes	No	Could support in directing set up or scheduling of major events	Medium
Physical qualities	Normative standards and reliability of tests relative to the position and level of the athlete	Yes	No	Would support talent identification and development, and monitoring the progress of a programme	Medium
Physical qualities	Effects of strength and power training in netballers	Yes	No	Could direct more specific training and preparation for performance, but some current wider research could be extended to the sport	Medium
Training and match load	The quantification of external and internal training load in senior professional and international athletes	Yes	No	Could influence daily and seasonal training practices	High
Training load	The appropriateness of training in preparation for match-play	Yes	No	Would allow for more effective training, robust programming, return to play plans and athlete development	High
No current research					
Biomechanics/ injury	Ground reaction forces interaction with injury outcomes/risk			Useful to assist in developing mechanisms to mitigate injury risk	Medium
Injury epidemiology	Systematic review/meta-analysis on injury epidemiology			Quick and effective information to inform policies and an opportunity to decrease injury risks at all levels	Medium
Injury epidemiology	Injury, and concussion, burden and recurrence rate at different age groups and playing standards			Important for long term health of player population; would enable the evaluation of current practices and development of programmes to try reduce recurrence	High
Injury risk and influence	Impact of specific rehabilitation protocols			Would inform practice to a greater depth than what already is delivered and could be used to update current practice guidelines	High



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Gaps in the literature

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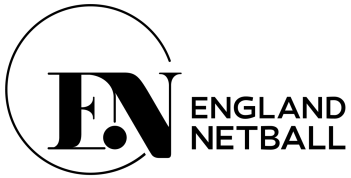

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		Limited	Conflicting		
Current evidence base is limited or conflicting					
Biomechanics/ injury	Landing technique influence on injury risk	Yes	No	Could direct landing training approaches under match conditions at all levels with potential for recommendations and coach training to infiltrate community netball	
Biomechanics/ injury	Lower limb movement screening and injury risk	Yes	Yes	Any links/associations would enable effective screening and training content	
Injury risk and influence	Role of physical capacity and other factors. Particularly with high-level athletes	Yes	Yes	Would enable a higher standard of decision making and athlete care through implementing training programmes that could mitigate/improve risk	High
Recovery	Effective recovery modalities; specifically during congested fixtures	Yes	No	Current wider research on recovery modalities are extendable to netball. Best strategies during periods of congested fixtures could benefit teams test-series or tournaments	Low
Match-play	Differences in technical-tactical characteristics between levels of play	Yes	No	Would support in directing training progressions through playing careers	Medium
Performance	Influence of fixture scheduling on individual and team performance	Yes	No	Could support in directing set up or scheduling of major events	Medium
Physical qualities	Normative standards and reliability of tests relative to the position and level of the athlete	Yes	No	Would support talent identification and development, and monitoring the progress of a programme	Medium
Physical qualities	Effects of strength and power training in netballers	Yes	No	Could direct more specific training and preparation for performance, but some current wider research could be extended to the sport	Medium
Training and match load	The quantification of external and internal training load in senior professional and international athletes	Yes	No	Could influence daily and seasonal training practices	High
Training load	The appropriateness of training in preparation for match-play	Yes	No	Would allow for more effective training, robust programming, return to play plans and athlete development	High
No current research					
Biomechanics/ injury	Ground reaction forces interaction with injury outcomes/risk			Useful to assist in developing mechanisms to mitigate injury risk	Medium
Injury epidemiology	Systematic review/meta-analysis on injury epidemiology			Quick and effective information to inform policies and an opportunity to decrease injury risks at all levels	Medium
Injury epidemiology	Injury, and concussion, burden and recurrence rate at different age groups and playing standards			Important for long term health of player population; would enable the evaluation of current practices and development of programmes to try reduce recurrence	High
Injury risk and influence	Impact of specific rehabilitation protocols			Would inform practice to a greater depth than what already is delivered and could be used to update current practice guidelines	High

What impact would it have?

Sports Medicine (2021) 51:1715–1731
https://doi.org/10.1007/s40279-021-01461-6

SYSTEMATIC REVIEW

The Applied Sports Science and Medicine of Netball: A Systematic Scoping Review

Sarah Whitehead[1,2,3] · Jonathon Weakley[1,4] · Stuart Cormack[5,6] · Helen Alfano[7] · Jim Kerss[8] · Mitch Mooney[5,9] · Ben Jones[1,3,10,11,12]

Accepted: 29 March 2021 / Published online: 4 June 2021

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Table 2 Examples of future research directions in topics for which the current evidence base is limited or conflicting, and in topics where there is no current research

Research topic	Focus	Current evidence base		What is the clinical and practical relevance of this research? (i.e., impact on policy and practice)	What is the priority for this research to be carried out? (low/medium/high)
		Limited	Conflicting		
Current evidence base is limited or conflicting					
Biomechanics/ injury	Landing technique influence on injury risk	Yes	No	Could direct landing training programmes undertaken at all levels with potential for recommendations and coach training to infiltrate community netball	Medium
Biomechanics/ injury	Lower limb movement screening and injury risk	Yes	Yes	Any links/associations could direct effective screening content	Medium
Injury risk and influence	Role of physical capacity and other factors. Particularly with high-level athletes	Yes	Yes	Would enable a higher standard of decision making and athlete care through implementing training programmes that could mitigate/improve risk	High
Recovery	Effective recovery modalities; specifically during congested fixtures	Yes	No	Current wider research on recovery modalities are extendable to netball. Best strategies during periods of congested fixtures could benefit teams test-series or tournaments	Low
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Injury risk and influence	Impact of specific rehabilitation protocols			Would inform practice to a greater depth than what already is delivered and could be used to update current practice guidelines	High

What is the priority?

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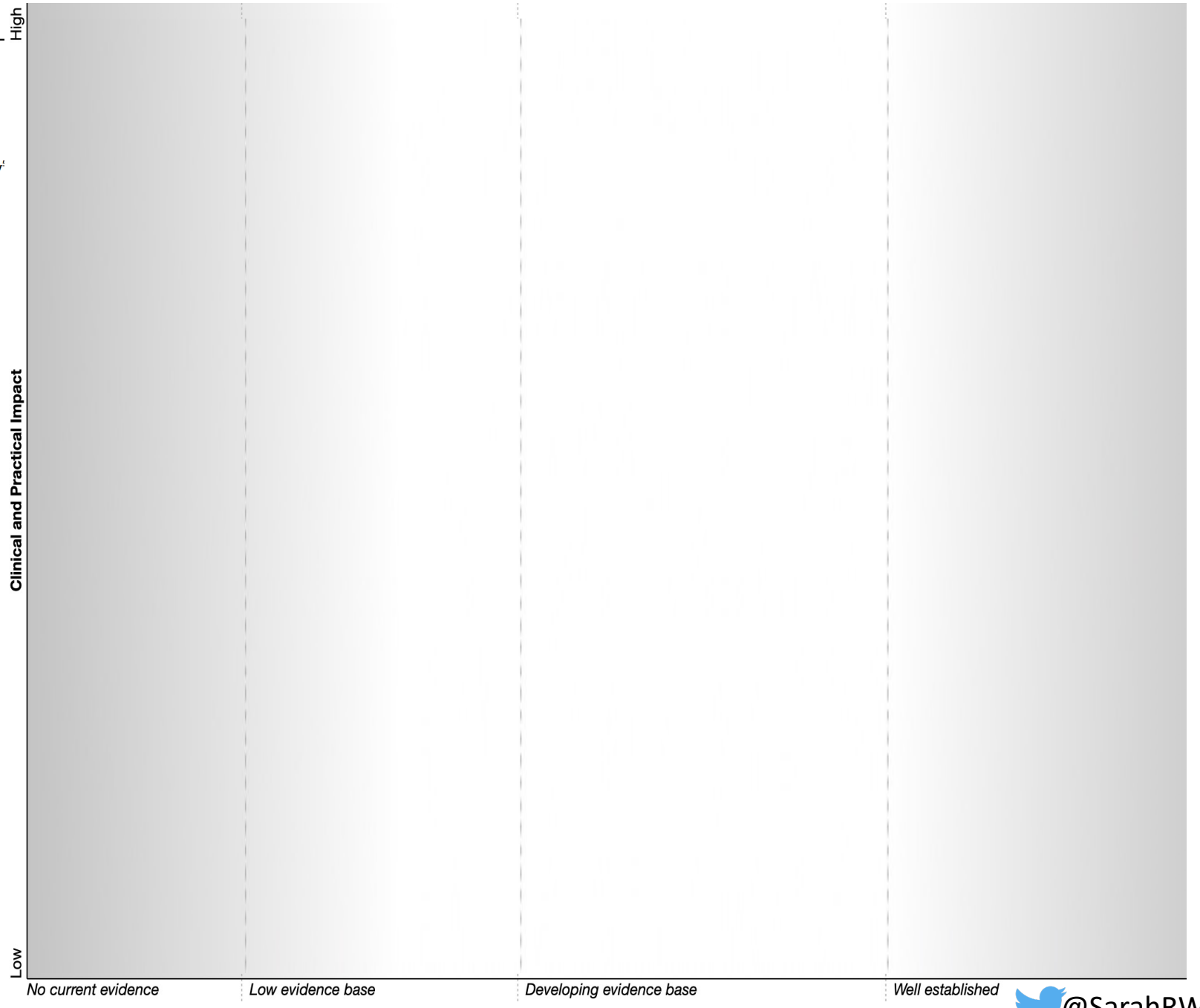

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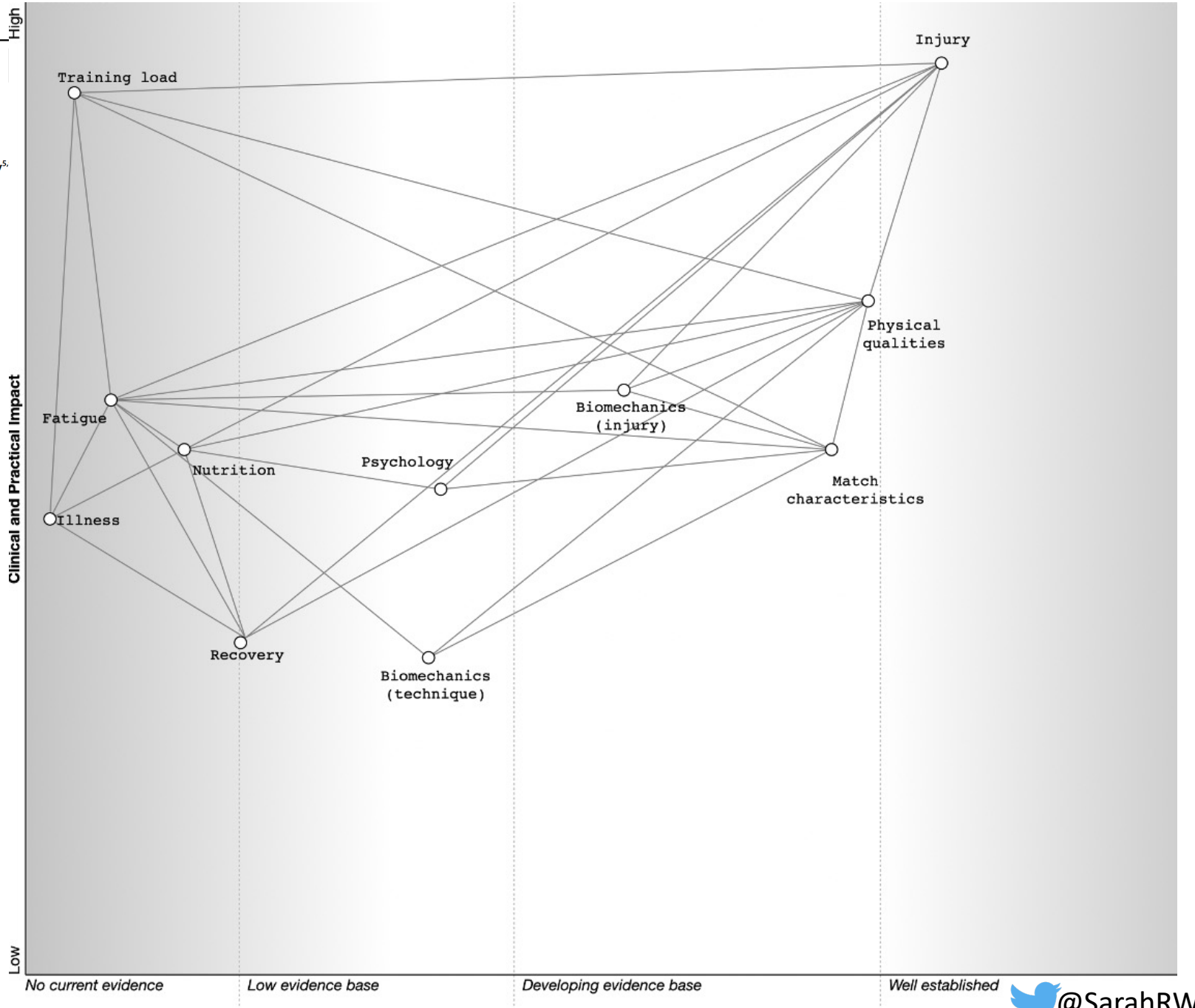

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PLOS ONE

Downs et al. Sports Medicine - Open (2021) 7:3
https://doi.org/10.1186/s40798-020-00290-7

Sports Medicine - Open

SYSTEMATIC REVIEW Open Access

Injuries in Netball-A Systematic Review

Christopher Downs[1,2], Suzanne J. Snodgrass[1,2], Ishanka Weerasekara[1,3], Sarah R. Valkenborghs[2,4] and Robin Callister[2,4*]

RESEARCH ARTICLE

Movement intensity demands between training activities and competition for elite female netballers

Edward R. Brooks[1]*, Amanda C. Benson[2], Aaron S. Fox[1], Lyndell M. Bruce[1]

1 Centre for Sport Research, School of Exercise and Nutrition Sciences, Deakin University, Burwood, Victoria, Australia, **2** Department of Health and Medical Sciences, Sport Innovation Research Group, Swinburne University of Technology, Hawthorn, Victoria, Australia

PLOS ONE

Physiological and Perceptual Recovery-Stress Responses to an Elite Netball Tournament

in International Journal of Sports Physiology and Performance

Suzanna Russell, Marni J. Simpson, Angus G. Evans, Tris...

View More +

DOI: https://doi.org/10.1123/ijspp.2020-0317

Keywords: SRSS questionnaire; salivary cortisol; salivary alpha-amylase; IMU; player workload; fatigue

RESEARCH ARTICLE

Understanding load in netball – An analysis of multiple seasons, phases, and teams

Lyndell Bruce*, Tanisha Bardzinski, Dan Dwyer

Centre for Sport Research, School of Exercise and Nutrition Sciences, Deakin University, Burwood, Victoria, Australia

European Journal of Sport Science, 2022
Vol. 22, No. 3, 314–325, https://doi.org/10.1080/17461391.2020.1869837

Routledge Taylor & Francis Group

Check for updates

frontiers in Sports and Active Living

ORIGINAL RESEARCH
published: 22 October 2021
doi: 10.3389/fspor.2021.743612

Check for updates

ORIGINAL ARTICLE

The neuromuscular, physiological, endocrine and perceptual responses to different training session orders in international female netball players

LAURENCE P. BIRDSEY[1,2], MATTHEW WESTON[3], MARK RUSSELL[4], MICHAEL JOHNSTON[5], CHRISTIAN J. COOK[6], & LIAM P. KILDUFF[1,7]

Creating a Live and Flexible Normative Dataset for Netball

Hayden Croft[1,2], Kirsten Spencer[2], Noeline Taurua[3] and Emily Wilton[1]*

[1] Institute of Sport Exercise and Health, Otago Polytechnic, Dunedin, New Zealand, [2] Sports Performance Research Institute New Zealand, Auckland University of Technology, Auckland, New Zealand, [3] Netball New Zealand, Auckland, New Zealand

Directions for future research in netball?

- **Training load**; youth and senior
- Injury **risk factors, burden** and **reoccurrence**
- Influence of physical qualities; **injury**, **fatigue** and **match** profiles
- **Interaction** of match actions, playing style and physical activity profiles
- **Female health;** urinary incontinence
- **REDs** and mental health

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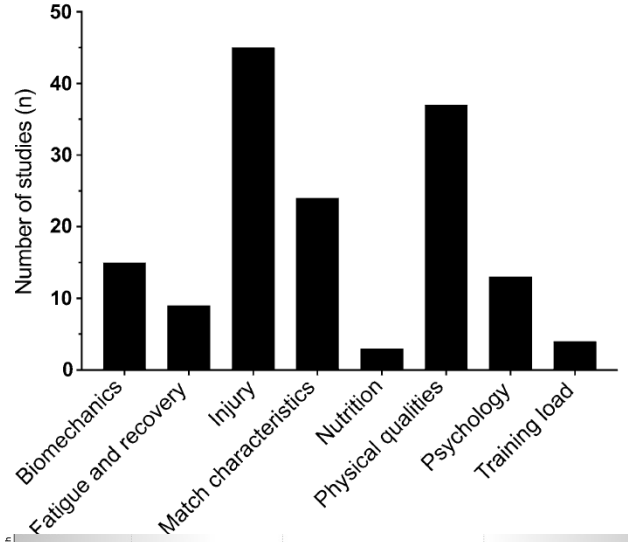
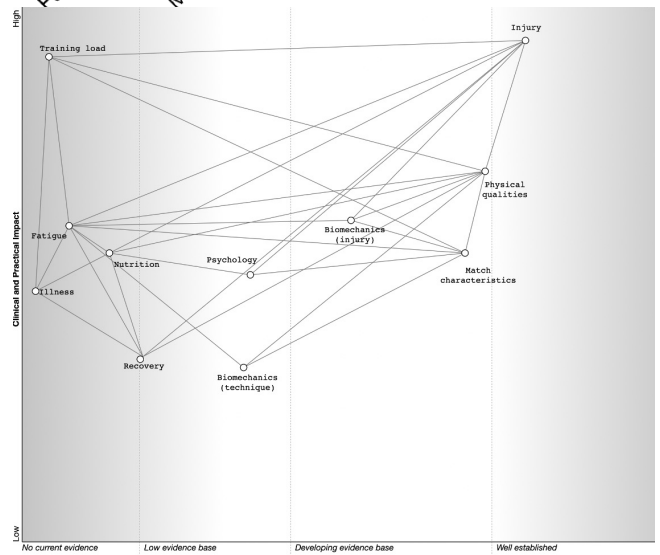
Summary

- **Lack of research** in sports science and medicine in netball
- **Rapid increase** in recent years; increased **professionalism** and **funding**, developments in **technology**
- Majority of research focuses on **injury**, **match-characteristics** and **physical qualities**
- Can utilise ‘current evidence’ and ‘impact’ to determine **priority of future research**





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Thank you for listening

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