WELSH INSTITUTE
OF PERFORMANCE SCIENCE

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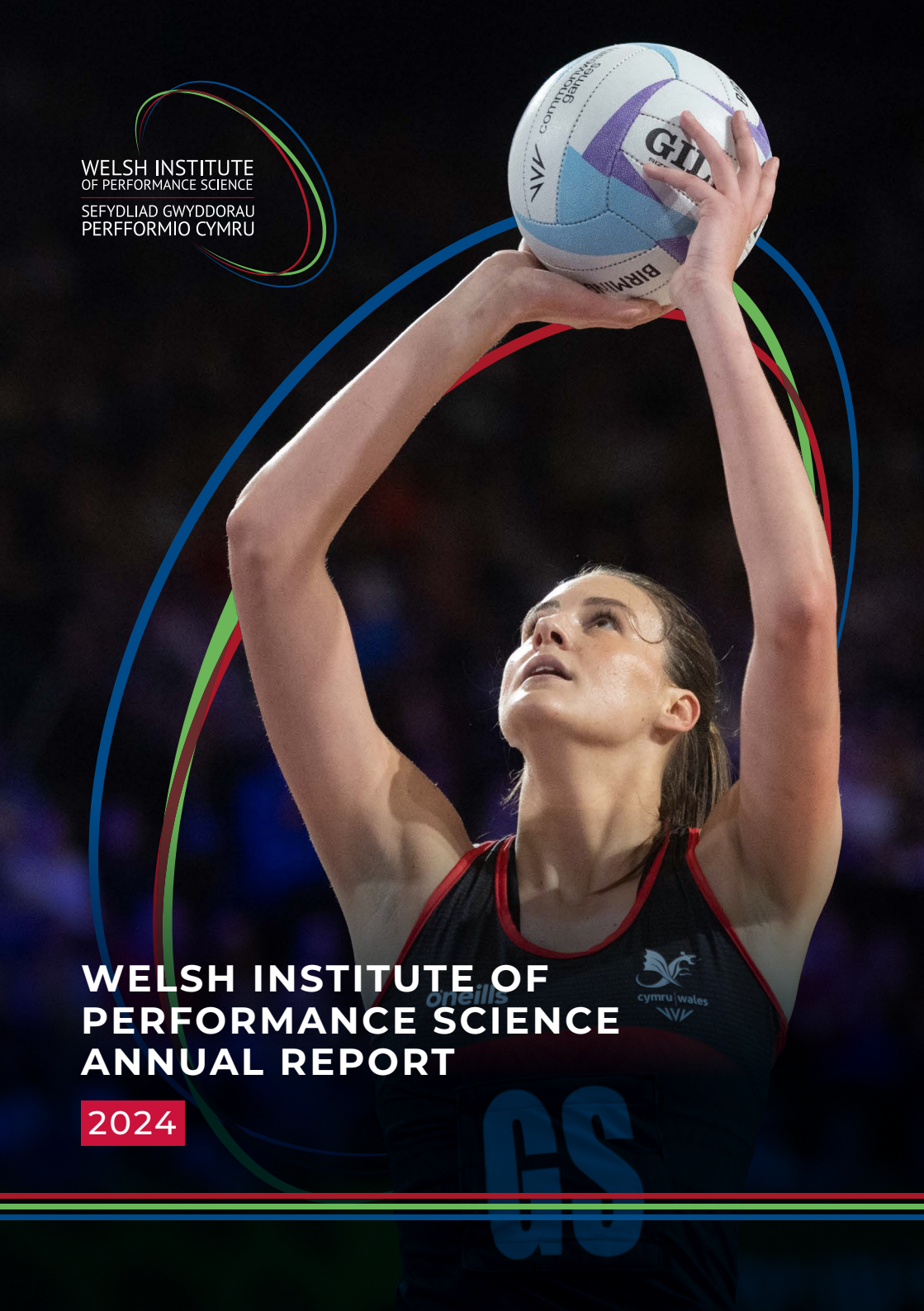


WELSH INSTITUTE OF PERFORMANCE SCIENCE ANNUAL REPORT

2024

THE YEAR IN REVIEW

2024 has been another productive year for WIPS and our partners. We have continued to work on 22 projects, including 5 new projects. These projects have ranged across the three themes of Athlete Health and Wellbeing, Athlete Development, and Athlete Environments, including projects exploring bio-psycho-social approach to female athlete health and performance, thriving life stories and, talent development of high-performance beach rowers. It has been exciting to support Sport Wales in implementing their new themed approach and watching how these projects have expanded understanding and support across these different areas.

We are also delighted to have completed 5 projects and to have had the opportunity to share the learning from these with practitioners and coaches within and beyond Sport Wales. Particular highlights include the WIPS lunch and learn series, where WIPS members delvered talks on projects; *The swimming start: Measurement, importance and enhancement through pre-race interventions*, *The implementation of a behaviour-based mental toughness framework within international youth football* and *Low energy availability screening: a pilot study in Triathlon*. The purpose of WIPS has always been to produce applied research that is shared with those who can use these insights in practice. To have influenced across such a broad range of individuals and settings is particularly pleasing.

Finally, during a year of financial challenges across various sectors, we are particularly pleased to have secured a further year of funding from Sport Wales to continue the ongoing projects and to develop further insights to support the growth and development of athletes across Wales. This extended support demonstrates the benefit of WIPS to athletes, coaches, and practitioners across Wales and we are extremely grateful to all who have engaged with, and supported, our projects through 2024. Looking forward to what we can all achieve together throughout 2025.

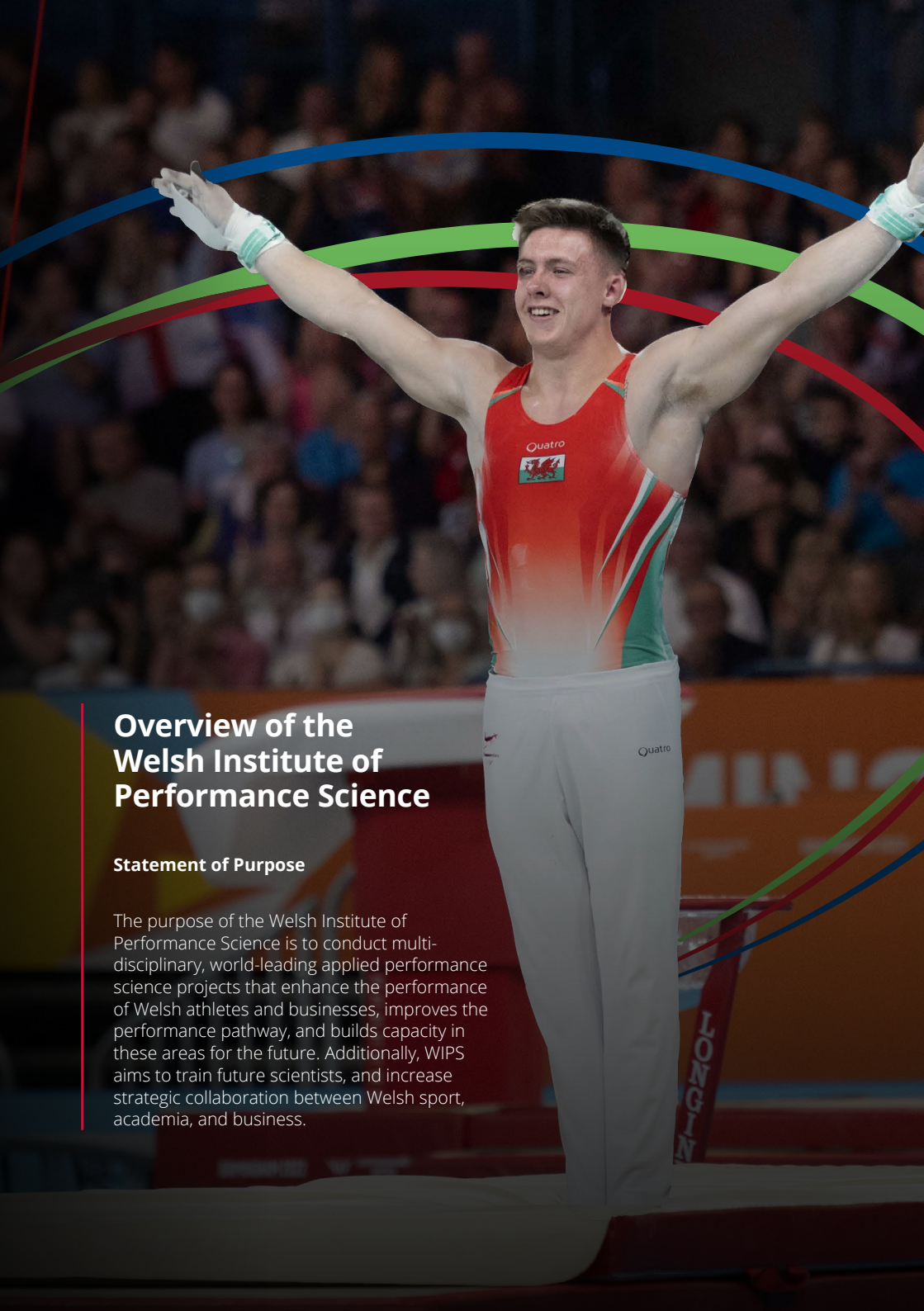
Wishing you a successful and enjoyable year ahead,

Liam, Esther, Camilla,

and the members of the RSG & SMB.

Some Key Points from 2024:

- **5 new projects completed**
- **Renewal of funding**
- **22 projects currently active**
- **Submission of a 10 year review of WIPS**



Overview of the Welsh Institute of Performance Science

Statement of Purpose

The purpose of the Welsh Institute of Performance Science is to conduct multi-disciplinary, world-leading applied performance science projects that enhance the performance of Welsh athletes and businesses, improves the performance pathway, and builds capacity in these areas for the future. Additionally, WIPS aims to train future scientists, and increase strategic collaboration between Welsh sport, academia, and business.

FUNCTION AND PROCESS

The Welsh Institute of Performance Science will work to enhance performance in Welsh sport and increase links between sport, academia, and business in the following ways. Priority will be given to the first three approaches:

1 **Performance Driven Questions, Science Driven Answers**
Following evaluation of Welsh sport performances and systems, performance issues or areas to improve will be identified; the Research Steering Group and Sport Wales representatives will then discuss and seek out potential strategies, leading to projects being conducted to address the question or issue.

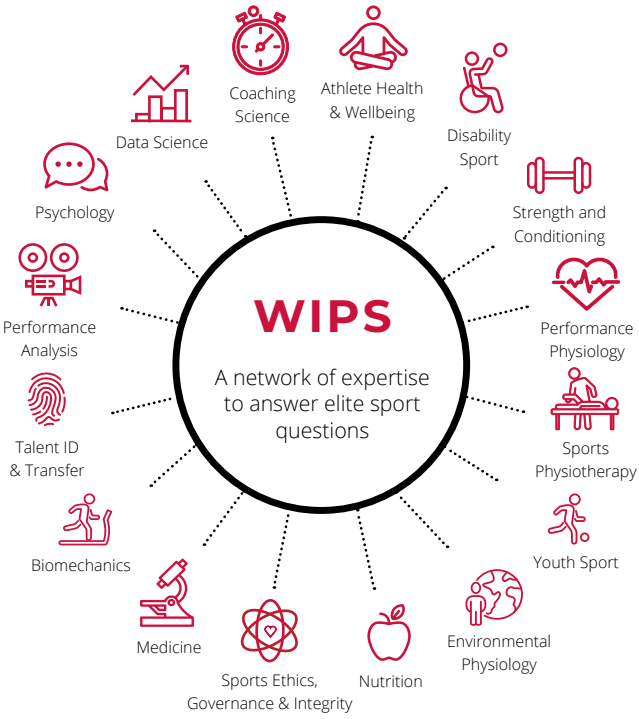
2 **Performance Driven Questions, Industry Driven Answers**
Following evaluation of Welsh sport performances and systems, performance issues or areas to improve will be identified; the Research Steering Group will then discuss and seek out potential strategies, leading to collaboration with appropriate industry partners to answer the performance question.

3 **Performance Driven Questions, Science and Industry Driven Answers**
Following evaluation of Welsh sport performances and systems, performance issues or areas to improve will be identified; the Research Steering Group will discuss and seek out potential strategies, leading to research being conducted in conjunction with industry partners to answer the performance question/issue.

4 **Science Driven Performance Applications to Enhance Performance**
Based on current research findings, Research Steering Group members can make suggestions to the wider Research Steering Group regarding potential performance enhancing strategies. If the Research Steering Group deem appropriate, research and discussion examining the feasibility and applicability of these strategies to Welsh sport performance will be conducted. If the findings yield positive outcomes these strategies may be implemented within Welsh sport via Sport Wales Institute.

5 **Industry Driven Performance Applications to Enhance Performance**
Industrial partners (and other innovation specialists) can approach the Research Steering Group regarding technological or industrial advances that might enhance sporting performance. If deemed appropriate by the Research Steering Group, research and discussion examining the feasibility and applicability of these strategies to Welsh sport performance will be conducted. If the findings yield positive outcomes these strategies may be implemented within Welsh sport via Sport Wales Institute.

THE 2024 RESEARCH STEERING GROUP COMPOSITION



THE 2024 THEME LEADS

THEME	SPORT WALES	WIPS
Athlete Development	Matt Archer	Vicky Gotwald
Athlete Environments	Cath Shearer	Camilla Knight
Health and Wellbeing	Hannah Llewellyn/Kath Brown	Denise Hill

EXAMPLES OF PROJECTS SUPPORTED BY WIPS THIS YEAR

PROJECT TITLE	PROJECT AIMS
The Examination of the Impact of a Digital Nutrition Platform on Nutritional Knowledge and Nutrition Behaviour in Athletes	**1.** To measure and understand the impact of the digital application on athlete's nutritional knowledge. **2.** To evaluate the impact of a digital nutriontion app on athlete's nutrition-related behaviours. **3.** To explore athlete's engagement with the digital application to understand user experiences.
Welsh Institute of Performance Science Knowledge Transfer	**1.** The process of implementation and knowledge translation (KT) that the Welsh Institute of Performance (WIPS) has used. **2.** What has happened in instances of successful implementation and KT. **3.** What has happened in instances of unsuccessful implementation and KT.
Bio-psycho-social Approach to Female Athlete Health and Performance	**1.** Assess the efficacy of individualised athlete MC symptoms, attitudes, and management strategies on health, training, and performance in development and senior-level elite athletes across a range of sports and cultures. **2.** Create comprehensive and evidence-informed guidance for athletes, coaches, and support staff for individualised MC symptom management strategies that can be applied across different sport practice settings, and across different sports/athletes.

PROJECT TITLE	PROJECT AIMS
Thriving Insights Project	**1.** Identify key themes from the existing qualitative data (e.g. interviews, focus groups, and life stories) linked to thriving environments. **2.** To explore participants perceptions of themes and how they can be formulated into resources/interventions to facilitate thriving environments. **3.** Propose resources/interventions to promote thriving environments across sports, informed by the people who it is intended for.
The FLIP Project: Female Lower-limb Injury Prevention	**1.** Establish benchmarks for kinetic measurements of jump-landing performance and injury screening assessments in female athletes across different stages of biological maturity, performance levels and sports. **2.** Quantify the magnitude of the injury problem. **3.** Identify risk-factors within jump-landing and strength assessments. **4.** Reduce injury rates through the introduction of an evidence-based targeted injury prevention training programme.
How Do We Effectively Measure Low Energy Availability across Athletes within the Welsh Sporting System?	**1.** A literature review of current assessment options including validity/reliability. **2.** The design of a specific tool/screener (or use of existing methodology) for use in triathlon.
Description and Evaluation of Co-design Peer-lead Menstrual Education	**1.** Describe and capture the co-design process with pupils and athletes. **2.** Co-produce a peer-lead menstrual education protocol. **3.** Evaluate the co-design process and outcomes to achieve a positive change in menstrual education provided in UK schools and sports.

PROJECT TITLE	PROJECT AIMS
Talent Development of High-Performance Beach Rowers	**1.** Identify multidisciplinary factors that contribute to the development of an elite beach sprint athlete. **2.** Better understand talent transfer pathways into the sport e.g. from alternative rowing disciplines Inform talent identification and development systems in beach rowing. **3.** Upskill coaches and support staff to understand the applied relevance of multidisciplinary talent related variables.
Understanding Sports Performers' Mental Wellbeing and Performance: The Role of Reflective Practice in Facilitating Hedonic and Eudaimonic Factors Through Needs Satisfaction and Self-Regulation	**1.** Examine the RP profiles (e.g. level and amount of engagement) of sport performers (coaches, athletes, and performance/support staff). **2.** Investigate whether there is a relationship between higher engagement and more meaningful, critical reflective practice and the experience of higher levels of mental wellbeing. **3.** Explore factors (e.g. basic psychological need satisfaction; self-regulation) that may moderate/ mediate the relationship between RP and mental wellbeing.
Understanding Peak Periods within International Football Based on GPS Data	To understand and define the most demanding periods within international football across age groups within both mens and womens pathways. The data will then further be used to influence training and support the teams style of play.

SPOTLIGHT ON PROJECTS

1. WOMEN AND GIRLS' TALENT DEVELOPMENT PATHWAY: EVALUATING THE GIRLS' ACADEMY PROGRAMME.

Project contributors

Prof. Brendan Cropley, Prof. Liam Kilduff, Prof. Camilla Knight, Dr. Martin Longworth, Prof. Jon Oliver, Lowri Roberts, Dr. David Adams.

Aims

The FAW developed an innovative female talent development programme in which regionally selected FAW girls' academy teams (U14s and U16s) have been integrated into age-appropriate male licensed academy competitions (U13s and U14s respectively). The purpose of this was to increase the amount and level of competition talented female players experience and facilitate player progression into the senior levels of the game. To understand the impact of this programme, this project aimed to provide a holistic evaluation of player development across the first two years of its inauguration.

Insights and Outcomes

The impact of the programme on player **technical and tactical performance** was assessed using match performance trends from performance analysis data (e.g. number of possessions; entries into the final third; duels won). Generally, over time, there appeared to be a series of positive performance outcomes, such as: (1) a better balance between time spent in and out of possession; (2) increased number of in-play turn-overs (regaining possession); (3) increased duration of each possession; and (4) improved number of average shots on target per game (e.g. U14s 5.4 – 6.1 shots on target).

Player **physical development** was measured through pre and post-season physical testing (e.g. 10m + 30m sprint, 505 change of direction, vertical jump; yo-yo IRT-2) and compared to a control group (e.g. an age matched grassroots girls' team). Positive trends were observed for all FAW academy teams in all measures across time in comparison to the control group. This potentially indicates that academy players are developing across physical parameters quicker (or more so) than they would if they had remained at their previous clubs.

From a **psychological and social** perspective, focus groups with the players and their parents revealed that players have, over the course of the first two seasons, become more autonomous, confident, and able to cope with the demands of the game and social issues associated with competing boys against girls. Further, players and parents indicated that they (or their child) were developing wider skills (e.g. decision making, leadership) that helped them in other aspects of their lives (e.g. school).

2. AN EDUCATION INTERVENTION TO IMPROVE FEMALE TEAM SPORT ATHLETES' KNOWLEDGE OF AND BEHAVIOURS AROUND THE MENSTRUAL CYCLE.

Project Contributors

Esther Goldsmith,
Dr. Natalie Brown,
Matthew Craythorne,
Alice Murray-Gourlay.

Aims

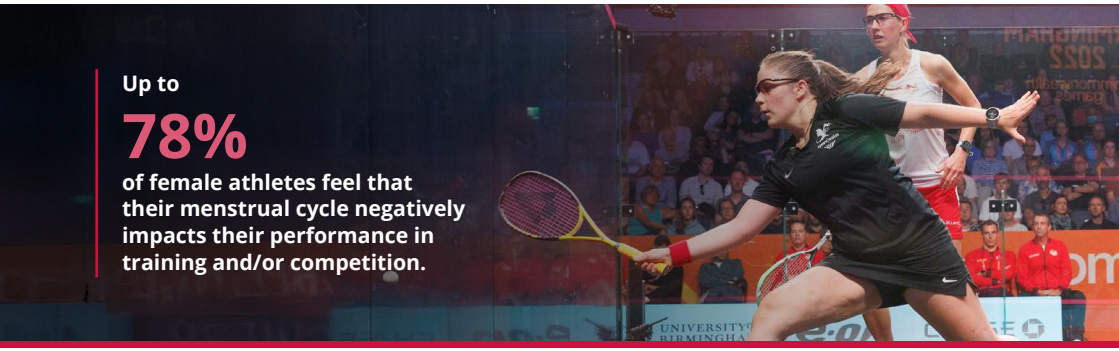
Up to 78% of female athletes feel that their menstrual cycle negatively impacts their performance in training and/or competition. To try and address this, menstrual cycle education is recommended in the literature and often sought after by coaches and performance directors. However, it has not been assessed if education is successful to prevent negative effects of the menstrual cycle. Whilst education is one of the possible interventions featured on the Behaviour Change Wheel (Michie et al., 2011), in isolation, an education session delivered by a sports science practitioner may not be sufficient to change behaviours around the menstrual cycle to better support female athletes. Therefore, the aim of the study has been to assess whether three menstrual cycle education workshops were effective at improving knowledge and changing behaviours around the menstrual cycle in team sport female athletes.

Outcomes

The data that has revealed that whilst education workshops might improve athletes' knowledge of the menstrual cycle, education is not effective at changing behaviours around the menstrual cycle. This may be because other interventions, such as a focus on creating an open and supportive environment around the menstrual cycle, need to accompany education for it to be effective to achieve behaviour change. Educational interventions may also need to be embedded over a longer period to effectively transfer increase knowledge into practice. The data also highlighted the importance of interventions in this space, nearly half of athletes felt their menstrual cycle negatively impacted their training and/or performance but only 27% ever talked to their coach about their cycle.

Impact

Practitioners and sports can be empowered by the findings of this project and work together on a more long-term but effective approach to supporting female athletes around the menstrual cycle.



3. THE EXAMINATION OF THE IMPACT OF A DIGITAL NUTRITION PLATFORM ON NUTRITIONAL KNOWLEDGE AND NUTRITION BEHAVIOUR IN ATHLETES.

Project contributors

Prof. David Shearer, Prof. Brendan Cropley, Dr. Hannah Wixcey, Olivia Barnes, Welsh Cycling.

Aims

Nutrition plays an important role for athletes across the lifespan, yet many athletes report challenges such as limited access to nutrition resources and a lack of personalised options, which act as barriers to maintaining optimal nutrition (Dunne et al., 2022). One potential solution to such challenges is utilising digital applications to deliver tailored nutritional guidance. Further, providing athletes with an opportunity to engage with and provide feedback on such tools can help determine their effectiveness and practicality.

This project aims to assess the effectiveness of a digital sports nutrition application on the nutritional knowledge and behaviours of Welsh cyclists. By using a mixed method, single case research design, we aim to:

a. Measure and understand the impact of the digital application on athlete's nutritional knowledge.

b. Evaluate its impact on athlete's nutrition-related behaviours.

c. Explore athlete's engagement with the digital application to understand user experiences.

Outcomes

This research will provide valuable insights into the potential benefits and limitations of using a digital nutrition application to influence athlete's nutrition knowledge and behaviours. These findings will inform strategies to more effectively support athletes by addressing barriers to accessibility and enhancing the personalisation of recommendations.

Potential Impact

By engaging with the digital nutrition application, athletes may overcome key barriers to accessing and implementing effective nutrition strategies. This could lead to improved nutritional knowledge and behaviours, such as enhanced self-management of nutrition practices. Ultimately, this intervention has the potential to contribute to improved health, performance, and sustainability of optimal nutritional practices in athletic populations.

HOW WIPS PROJECTS WORK

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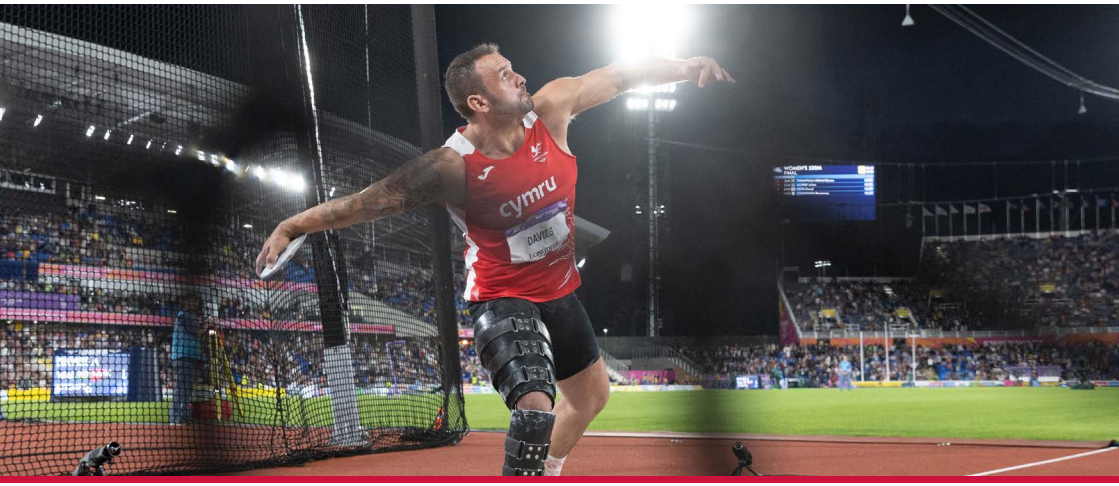
01 Sports & Practitioners (Stakeholders) identify a performance issue.

02 Stakeholders and WIPS plan a method and collaborative team to understand it better.

03 Collaborative research team work to reach new understanding.

04 Collaborative research team feedback new knowledge.

05 Stakeholders implement strategies based upon new knowledge.



THANK-YOU TO THE RESEARCH STEERING GROUP MEMBERS FOR THEIR CONTRIBUTIONS

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Dr Mark Waldron (Performance Physiology Lead)
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And the outstanding Research Associates:

- **Dr. Natalie Brown**
- **Dr. Dan Cunningham**
- **Dr. Alan McKay**
- **Dr. Hannah Wixcey**

If you would be interested in connecting with any of the Research Steering Group members or learning more about their research, please contact us at **WIPS@swansea.ac.uk** and we will be more than happy to connect you.

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