

an Indigenous community-based partner. Both Indigenous and non-Indigenous members of the research team engaged in critical reflection to identify lessons learnt and inform future projects in other community health settings.

**Results and discussion:** The CONSIDER statement provided a valuable framework for documenting key processes and detailing how Indigenous research principles were prioritised throughout the research journey. Researchers identified an inherent tension between participatory research principles and the expectations of funding agencies and academia. Consequently, research timelines and activities must be flexible to allow for sufficient community engagement and unforeseen community events. It is also essential for researchers and community stakeholders to embrace personal tensions that may occur whilst working at the cultural interface. Tensions may be linked to the reorientation of power dynamics associated with participatory research or the pressures Indigenous researchers face from community and academia to ensure a culturally appropriate project. Furthermore, differences in professional and cultural knowledge systems need to be acknowledged and accounted for within the early stages of a research project to ensure transparent communication and informed decision making.

**Impact and application to the field:**

- This paper details how an intercultural and intersectoral research team engaged in a participatory Indigenous health research project, providing a template for future research and practice collaborations.
- Identified lessons learnt will assist academics, practitioners and relevant stakeholders in future design, development, and delivery of Indigenous health promotion programs, ensuring the most appropriate health solutions are devised. However, it must be recognised that each Indigenous community is unique, and this must be accounted for when applying these key learnings.

**Conflict of interest statement:** My co-authors and I acknowledge that we have no conflict of interest of relevance to the submission of this abstract.

<http://dx.doi.org/10.1016/j.jsams.2022.09.129>

(P100051)

**A change point method to inform athlete progression in the return to sport progress**

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**Introduction:** Return-to-sport (RTS) decision-making is often challenging, as rehabilitation is complex and non-linear. With advances in technology, an increasing volume of data is being collected at multiple time points during rehabilitation to track the progression. Computer-based analytical methods, such as change point (CP) detection, can leverage the data collected longitudinally to inform clinicians of the time points when there were meaningful changes. Here, we exemplify how longitudinal data in wellness and rehabilitation running performance data could be analysed with the CP approach. The CP approach holds promises for informing clinicians the rate of progression in rehabilitation and thus allowing clinicians to quantify and evaluate the RTS process.

**Methods:** The case was a professional football player who sustained a lower limb muscle injury during training. Data were prospectively collected during the 2021/2022 A-League season. Four

variables from wellness (mood, sleep quality, muscle soreness, and stress) and five variables from rehabilitation running performance (total distance, maximum speed, high speed running, acceleration and deceleration) were collected over 97 days. Change point algorithm, performed in the R Studio, was then used to identify meaningful changes during the rehabilitation. The CPs were determined based on the mean and variance of the segments.

**Results:** Two types of analysis were performed, univariate and multivariate analysis. In the univariate analysis, the change points for mood, sleep, soreness and stress were located on days 30, 47, 50 and 50 respectively. The change points for total distance, acceleration, maximum speed, deceleration and high-speed running were located on days 32, 34, 37, 41 and 41 respectively. The multivariate analysis resulted in a single change point for the wellness variables and running performance variables, on days 50 and 67 respectively.

**Discussion:** The univariate approach provided information specific to each of the nine wellness and running performance variables, which could help clinicians to understand the rate of progression based on a single variable. The multivariate approach has the advantage to aggregate information regarding changes from multiple variables into a common change point. The common change point could simplify multiple time series data into relatively simple output for clinicians, providing an overall impression of the rehabilitation. Furthermore, although the wellness and running performance variables in this study were from different sources and of various data formats, all the variables can be visualised together in the same panel. Clinicians are encouraged to adapt similar analytics to quantify and evaluate rehabilitation programs.

**Impact and application to the field:**

- Clinicians working in RTS could use univariate change points to determine when a single performance variable has progressed or regressed.
- Multivariate change point detection allows clinicians to simplify the information input and be less likely to be overwhelmed by the high volume and different types of data.

**Conflict of interest statement:** My co-authors and I acknowledge that we have no conflict of interest of relevance to the submission of this abstract

<http://dx.doi.org/10.1016/j.jsams.2022.09.130>

(P100054)

**Implementing telehealth-delivered group-based education and exercise for osteoarthritis during the COVID-19 pandemic: A mixed-methods evaluation**

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**Introduction:** The Good Life with osteoArthritis from Denmark (GLA:D®) program provides group-based education (2 sessions) and exercise-therapy (12 sessions) for people with knee and hip osteoarthritis at >500 sites in Australia and is associated with clinically meaningful improvements in pain and quality of life (QoL). During the COVID-19 pandemic, physiotherapists in Australia were supported to provide GLA:D® via telehealth. The aim of this

mixed-methods project was to evaluate the implementation of GLA:D® via telehealth.

**Methods:** Evaluation Framework: Reach, Effectiveness, Adoption, Implementation, and Maintenance Qualitative Evaluation for Systematic Translation (RE-AIM QuEST). Quantitative: People with knee or hip osteoarthritis participating in GLA:D® via telehealth-only or a hybrid delivery of in-person and telehealth ( $\geq 3$  telehealth sessions) from March 2020-October 2021. Mean differences (MD) and effect sizes (ES) from baseline to 3-month follow-up were calculated for average pain (0-100) and joint-related QoL (KOOS-QOL, HOOS-QOL sub-scales). Participants rated perceived recovery (global rating of change scale -3 to 3; 1-3=recovered) and program satisfaction (scale 1-5; 4,5=satisfied). Qualitative: 23 GLA:D® trained physiotherapists (n=12 telehealth adopters; n=11 non-adopters) from diverse (private/public practice, urban/rural) settings completed one-on-one semi-structured interviews. Interviews were transcribed and analysed using a reflexive thematic approach.

**Results:** Reach: 138 people (39 telehealth-only and 99 hybrid delivery; 69% female) participated in GLA:D® via telehealth. Mean (SD) age and BMI were 64 (9) years and 29.8 (5.5) kg/m<sup>2</sup>, respectively. Identified barriers and enablers for reach included technology literacy and access, personal preference and perceived value of telehealth, and availability of exercise equipment. Pandemic restrictions to in-person GLA:D® was an enabler.

Effectiveness: Average pain decreased for telehealth-only (MD, 95%CI=-10, -16 to -4; ES=-0.54) and hybrid delivery (MD=-11, -16 to -6; ES=-0.43) GLA:D®. Joint-related QoL improved for telehealth-only (MD=9, 3 to 14; ES=0.51) and hybrid delivery (MD=12, 8 to 16; ES=0.65) GLA:D®. At 3-months, 81% of participants were recovered and 88% were satisfied. Most physiotherapists believed telehealth was as effective as in-person and felt patients were better able to continue exercising at home.

Adoption: 92 physiotherapists (74 health services) delivered GLA:D® via telehealth, most stating it had become a normal part of their practice. Adoption barriers included preferring, and greater confidence with providing, in-person GLA:D®.

Implementation: 70% (n=96) of participants attended both education sessions and 91% (n=125) attended >10 exercise-therapy sessions. Telehealth-delivered GLA:D® involved modifications to assessment, exercise instruction, equipment, and reduced fee structures.

Maintenance: Lack of personnel capacity, low patient demand, and a need for telehealth training and support were sustainability barriers.

**Discussion:** Telehealth-delivered GLA:D® in Australia during the pandemic predominantly involved hybrid delivery. Patient outcomes following telehealth-delivered GLA:D® were comparable to published in-person registry data. However, implementation was limited, impeded by low perceived value by patients and lack of confidence and training of physiotherapists.

Impact and application to the field

- Telehealth-delivered group-based education and exercise provides a viable and effective option to provide people with osteoarthritis appropriate first-line care in Australia.
- Findings highlight the need for, and can help guide, community education about the value of telehealth, alongside training to support physiotherapists delivering GLA:D® via telehealth.

My co-authors and I have no conflict of interest related to the submission of this abstract

<http://dx.doi.org/10.1016/j.jsams.2022.09.131>

(P100056)

## Occupational factors associated with the development of spondylosis in physically demanding occupations: a rapid review

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**Introduction:** Spondylosis is a prevalent degenerative condition that can affect any spine region. Commonly associated with physically demanding activities, it is one of the most frequent causes of worker's compensation claims. However, the relationships between specific occupational exposures and the clinical diagnosis of spondylosis are not clear. Therefore, the aim of this review was to identify and review studies reporting on occupational risk factors for the development of spondylosis in physically demanding occupations.

**Methods:** Following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA), and methods detailed in a protocol published in advance, a search of seven databases was performed. The eligibility criteria were developed to identify factors that increase the risk of developing spondylosis in physically demanding settings. Included studies were critically appraised with specific tools for each type of study design to assess their methodological quality, and a narrative synthesis of the findings was completed.

**Results:** Six articles were included. Workers who carried load on the head, compared to those who did not, had higher prevalence of cervical spondylosis. Workers engaged in mentally demanding work, compared to those in 'physical-based' occupations (OR 1.65, 95% CI 1.22-2.25), male workers exposed to vibration (OR 1.60, 95% CI 1.05-2.45), and workers younger than 30 years of age who worked in the same posture for a period ranging from 1 to 2.9 hours per day (OR 12.52, 95% CI 1.60-97.85) were at increased risk of cervical spondylosis. Working for more than five years in 'heavy manual labour' was reported to increase the prevalence of thoracic spondylosis compared to individuals working in 'physically light work'. The risk of lumbar spondylosis was found to be higher in carpenters, machine drivers, workers in agricultural, forestry, and fishery industries, and in female workers who lifted weights of more than 10kg at least once a week. In tactical populations, enlisted personnel and those in the army are at increased risk of developing lumbar spondylosis.

**Discussion:** Findings of this review suggest that physically demanding occupations are associated with an increased risk of developing spondylosis. Specifically, occupations and occupational tasks associated with vibration, lifting weights, and maintaining the same posture for extended periods appear to increase the risk of developing spondylosis. However, these findings are mainly based on cross-sectional studies; therefore, results should be interpreted with caution. Further research is warranted to explore the topic.

**Impact:** Physically demanding occupations were found to be at increased risk of developing spondylosis. Additionally, vibration, lifting weights, and maintaining the same posture for extended periods appear to increase the risk of developing spondylosis.

### Conflict of interest statement:

This research was funded by the Department of Veterans' Affairs.

<http://dx.doi.org/10.1016/j.jsams.2022.09.132>