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Molly Coventry

Amanda Timler

Andrea B. Mosler

Kylie Russell

Mervyn Travers

See next page for additional authors

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Authors

Molly Coventry, Amanda Timler, Andrea B. Mosler, Kylie Russell, Mervyn Travers, Lauren Mitchell OAM, and Myles C. Murphy



"I lied a little bit." A qualitative study exploring the perspectives of elite Australian athletes on self-reported data

Molly Coventry^a, Amanda Timler^b, Andrea B. Mosler^c, Kylie Russell^d, Mervyn Travers^{a,e}, Lauren Mitchell OAM^f, Myles C. Murphy^{a,g,*}

^a School of Health Sciences and Physiotherapy, The University of Notre Dame Australia, Fremantle, Western Australia, Australia

^b Institute for Health Research, The University of Notre Dame Australia, Fremantle, Western Australia, Australia

^c La Trobe Sport and Exercise Medicine Research Centre, La Trobe University, Bundoora, Victoria, Australia

^d School of Medicine, The University of Notre Dame Australia, Fremantle, Western Australia, Australia

^e School of Physiotherapy and Exercise Science, Curtin University, Bentley, Western Australia, Australia

^f Radiology Department, Royal Perth Hospital, Perth, Western Australia, Australia

^g Nutrition and Health Innovation Research Institute, School of Medical and Health Sciences, Edith Cowan University, Joondalup, Western Australia, Australia

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ABSTRACT

Objectives: Explore the perceptions and experiences of elite Australian athletes' engagement with reporting data in surveillance systems.

Design: Qualitative Descriptive.

Setting: Semi-structured interviews conducted using Zoom.

Participants: We recruited 13 elite Australian athletes competing at a national or international level for semi-structured interviews.

Main outcome measures: Audio recordings were transcribed using DeScript, checked for errors and imported into QSR NVIVO. Thematic analysis using QSR NVIVO was used to determine key themes from transcripts.

Results: Thematic analysis uncovered four key themes: 'the paradox of reporting', 'data for data's sake', 'eyes on reporting' and 'athlete friendly reporting'.

Conclusion: Athletes perceived reporting as a burden and the athlete management system presented numerous technological difficulties which led to athletes to backfill data entries and compromise data accuracy. Athletes had little knowledge on how their data was used and managed and often received minimal feedback from staff accessing the data. Athletes were unaware of who has access to their data, which is of concern as sensitive information may be collected and athletes may be underage. As a result, many athletes chose to report dishonest data to avoid their performance being questioned.

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1. Introduction

Training exposure data are collected using various methods to monitor the overall and sport specific training load of elite athletes (Black et al., 2016; Gabbett, 2016; Murphy et al., 2021; Wisbey et al., 2010). Self-reported data require athletes to report their stress levels, fatigue, physical recovery and general health, collected in surveillance systems (Drew et al., 2018; Saw et al., 2015b). One

system used in Australia is the Athlete Management System (Australian Institute of Sport, 2022), which includes an application that can be downloaded onto athletes' personal electronic devices. Accurate surveillance of an athlete's internal load, monitored with athlete reported data, is essential, as identical external training loads can elicit very different internal loads (Wang et al., 2020).

Saw et al. (2016) noted that athlete reported data can be more sensitive and reliable than other methods of collecting exposure data and have superior responsiveness to training changes when compared to objective measures. However, the validity of using athlete reported data for clinical and research purposes has been recently challenged as it relies on the athlete's ability to accurately

* Corresponding author. Nutrition and Health Innovation Research Institute, School of Medical and Health Sciences, Edith Cowan University, Joondalup, Western Australia, Australia.

E-mail address: m.murphy@ecu.edu.au (M.C. Murphy).

report data in a real world setting (Hoyne et al., 2022; Phibbs et al., 2017). A recent investigation examined the accuracy of elite cricket players self-reported throwing loads and found they were grossly inaccurate, with only one-fifth of players being within 10% of their actual throwing volume (Hoyne et al., 2022). This is important as quantifying load is recommended for analysis of risk in Sports Medicine research. For example, in cricket research a measure of throwing load is recommended as a factor within analysis of shoulder injury incidence (Murphy et al., 2020). Murphy et al. (2021) proposed that reporting accuracy may decrease if the metric is perceived to not be used for its intended purpose or being collected but not actioned. Furthermore, metrics with perceived high burden may take away from the athletes' focus, performance, and lead to inaccurate reporting (Murphy et al., 2021). The type of information collected may influence the athlete's willingness to provide honest answers. This was demonstrated in a recent study where participants stated they were likely to underreport injuries and mental health conditions due to potential restrictions which may be placed upon their physical training capacity (Murphy et al., 2023). Therefore, one way to explore this concept further is to speak to elite athletes in order to understand their perceptions towards reporting data within these surveillance systems.

Unfortunately, little is known regarding the athletes' experience of self-reporting in surveillance systems, despite the importance of athlete engagement in producing accurate data. Data collected from elite athletes may be used by high performance staff for load management and injury surveillance, both critical for athletic performance. If inaccurate data is being analysed, both the athletes and staff's time are made redundant. Specifically, no identified studies have explored the perceptions of elite athletes on the usefulness and burden of recording load data. Therefore, the objective of this study was to report the perceptions and experiences of elite Australian athletes' engagement with athlete reported data, recorded in surveillance systems.

2. Methods

2.1. Methodology

A Qualitative Descriptive study design was used to capture the perceptions of elite, Australian athletes' experiences with self-reported data with additional information on strategies to improve methodological rigour presented within Appendix B. Qualitative Descriptive methodology is the most appropriate design for this research as it explores subjective issues and provides a direct voice to the perspectives of participants (Doyle et al., 2020). The results of this study have been reported using the consolidated criteria for reporting qualitative studies (COREQ) (Tong et al., 2007) to identify the perceptions and experiences of elite Australian athletes. This study also engaged a consumer representative, who has been awarded the Order of Australia Medal for services to her sport (LM), who was involved in all stages of the research process to help inform question design and final manuscript content.

2.2. Ethical approval

This project was approved by the University of Notre Dame Australia Human Research Ethics Committee (HREC ID: 2021-156F) and the Australian Institute of Sport Human Research Ethics Committee (HREC Reciprocal ID: 2021-156F).

2.3. Participant selection

Elite Australian athletes were sampled using convenience and snowball sampling. Participants were recruited through the

research teams professional contacts (convenience) and then also from recommendations of athletes who had already taken part in the study (snowball). Both of these sampling methods were used as there are a small number of elite, Australian athletes and contact with the athletes is limited due to their intense schedules and privacy requirements. The following inclusion criteria were applied: 1) elite, Australian athletes competing at a national or international competition level, 2) regularly required to enter self-report data into the Australian Institute of Sport's Athlete Management System with entries mandated to more than twice weekly and, 3) have used the Athlete Management System for greater than 12 months prior to study enrolment. Reporting requirements for athletes will vary depending on their national sporting organisation and high-performance staff requirements. All athletes, even if underage, are responsible for entering their own data. Sampling was continuous until thematic saturation was achieved, as judged by study authors MC and AT (Busetto et al., 2020). The research team distributed a Qualtrics survey (Qualtrics, Provo, UT), which included the participant information sheet, consent documentation, and demographic data. Thirteen athletes (six female and seven male) across Australia (six from Western Australia, six from Queensland and one from Victoria) consented to participate in this study.

2.4. Measures

A total of six questions were developed and presented to participants in online semi-structured one-on-one or small group interviews (Appendix A). Participants were included in a small group interview ($n = 7$), or a one-on-one interview ($n = 6$) based off their availability and training schedule. The questions were informed by the findings of Saw et al. (2015b) who examined factors influencing implementation of self-reported outcome measures and were developed with assistance from members of the research team who had experience working with high performance athletes and an elite athlete representative (LM). The questions explored the types of measures required to report, length of time to enter the data, how important athletes believed the data was, what they believed it was used for, suggestions they had for improvement and their overall experience. All interviews were conducted between December 2021 and April 2022. The duration of interviews ranged from 15 to 45 min and were audio recorded using Zoom Cloud Meetings (Zoom Video Communications, 2022).

2.5. Data analysis

Recordings were transcribed verbatim using DeScript (DeScript, 2021) version 36.1.0 and were subsequently cross checked with the audio recording by a single study author (MC), using an established method (Murphy et al., 2022). Member checking between three members of the research team (MC, AT, and KR) was completed to ensure the common themes were representative of the sample. The final, de-identified transcripts were stored within the University of Notre Dame Australia Microsoft Teams. Given this study sampled elite athletes, transcripts are not available as the responses within the transcripts would enable identification of the participants. A thematic analysis approach using Braun and Clarke (2006) six stages was followed to identify key themes and ideas. The transcripts were digitally encoded by the lead researcher (MC) with guidance from experienced qualitative researchers (AT and KR) to establish credibility and transferability of the results. The transcripts were read to create open codes and then re-read line by line to ensure familiarity with the text to establish more in-depth coding (Findlay et al., 2020). Participant's demographic information (e.g., gender, type of sport and sport classification) was used to

establish conformability in the findings. NVIVO version 12 (QSR International Ptd Ltd, 2022) was used for data management and storage.

3. Results

An overview of the themes and subthemes, with a summarising quote, is presented within Fig. 1. A total of four key themes were identified from the 13 elite athlete's responses with athlete demographic data displayed in Appendix C. These themes included; 'the paradox of reporting', 'data for data's sake', 'eyes on reporting' and 'athlete friendly reporting'. Fig. 2 demonstrates how the athletes' perception of the usefulness and burden of athlete reported data is impacted by the key themes.

3.1. The paradox of reporting

The first theme identified was the paradox of reporting which covered the burden experienced by athletes reporting into surveillance systems (Table 1). The purpose of collecting data from athletes is to reduce the incidence of injury and maximise their athletic performance. However, athletes found reporting into surveillance systems more burdensome than useful. This was specifically related to issues with technology, late data entry, and the time burden reporting presents.

3.2. Data for data's sake

The theme of 'data for data's sake' indicated the lack of understanding around the reporting of data, who accessed the data, and how this did or did not make a difference to the athletes training

load, which was related to a lack of understanding and feedback (Table 2).

3.3. Eyes on reporting

The third theme highlighted the mistrust athletes had in who was accessing and interpreting the data reported into the surveillance system (Table 3). In contrast, athletes reported the trust shared with their coach was pivotal to training load changes.

3.4. Athlete friendly reporting

The final theme considered the athlete's opinion and perspective on surveillance system platforms, which highlighted the superficial level of the current reporting system despite advances in technology in other platforms (Table 4). The provision of feedback created increased compliance and engagement.

4. Discussion

This Qualitative Descriptive study investigated athlete's perceptions on the usefulness and burden of athlete reported outcome measures entered in surveillance systems. The findings of the interviews demonstrated the numerous challenges athletes face when self-reporting data in the Athlete Management System. The key themes highlighted above, showcase the athlete's perception of how self-reporting data daily into surveillance systems was not useful and a burden due to numerous factors including technological issues, time burden, lack of athlete understanding of the rationale for reporting, insufficient feedback, and a mistrust in the reporting system.

Several technological issues with the mobile surveillance

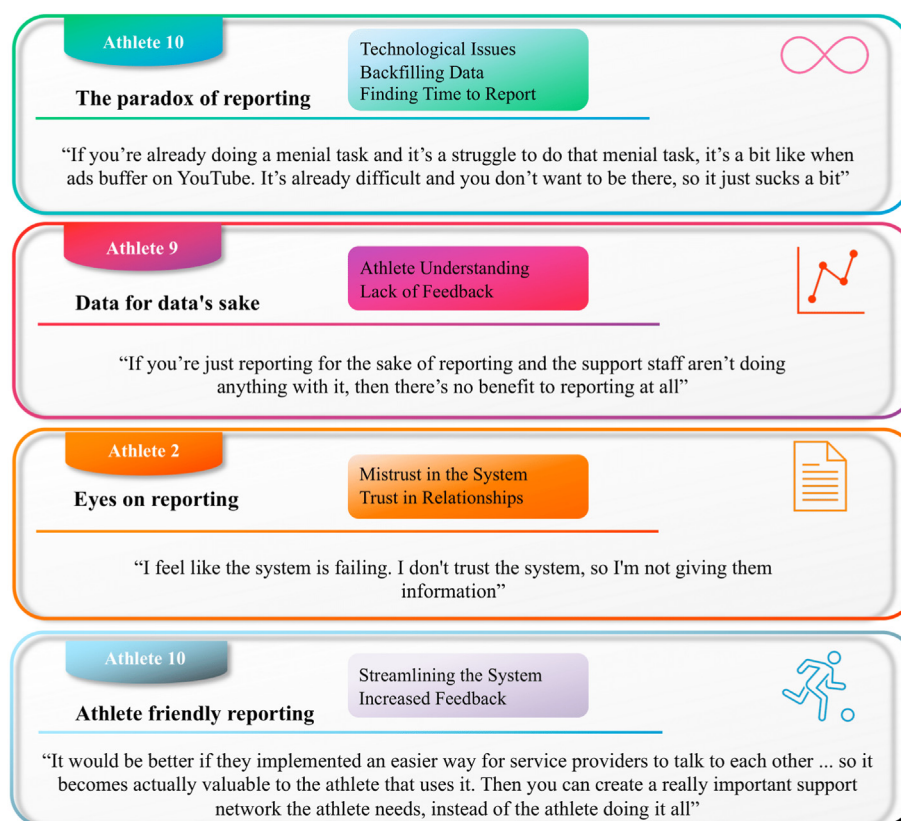


Fig. 1. Themes, subthemes and supporting quotes.

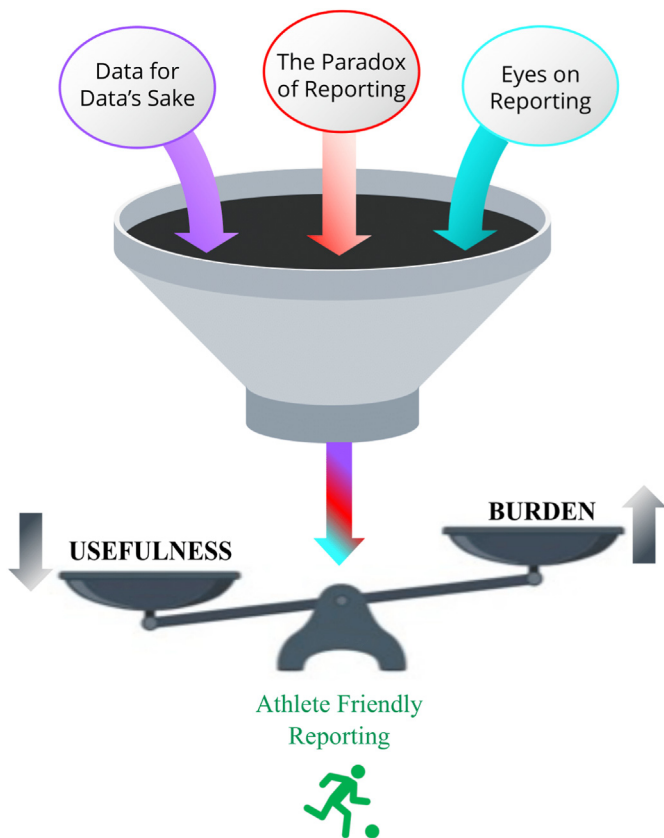


Fig. 2. The interaction of themes ‘the Paradox of Reporting’, ‘Data for Data’s Sake’ and ‘Eyes on Reporting’ with the athletes’ perception of usefulness and burden of self-reported data.

system application platform were highlighted by the athletes, which impacted their ability to report daily and accurate data. The main issues were related to the slow response time and confusing layout of the application, leading to the athletes reporting in bulk at the end of the week or even month. The time delay between athletes performing the training and reporting presents a major concern for data accuracy, recognised as a challenge by both players and staff in an earlier study (Duignan et al., 2019a). Recently coaches and support staff completed a survey to outline the current methods for athlete self-reporting and found 72% (n = 18) of surveillance data were collected through mobile devices (Neupert et al., 2022). However, the authors were unclear on the efficacy of this

method, and if the use of mobile technology improved engagement in reporting (Neupert et al., 2022). Saw et al. (2015a) found athletes described the mobile phone application as difficult to navigate, not user friendly, and that data entry took longer than expected. Despite the advancements in application technology since the previous study (Saw et al., 2015a), the surveillance mobile phone application discussed in this study still posed a challenge for athletes. The current study suggests the reporting application platform was detrimental to athlete engagement and reporting created additional workload that did not lead to any clear benefits for the athletes.

The lack of athlete understanding on the rationale for reporting may have implications on their motivation to report frequently and accurately. Athletes in this study experienced a lack of education on the reasons for reporting and were unsure of the purpose and use of the data. Clarity of purpose is vital for positive outcomes, yet findings suggest this purpose, which should be known by sports medicine staff, is not being communicated to the athletes (Duignan et al., 2019b). Athlete buy-in is essential for accurately reported data, therefore education is essential to improve athlete motivation to report and reduce the pressure athletes may feel to report untrustworthy data (Saw et al., 2015a). Further education should include information regarding the rationale for reporting and how the data was used for the benefit of athletes training and performance (Saw et al., 2015b).

Athlete compliance and accuracy was influenced by their perceived lack of feedback and communication from sports medicine staff monitoring the data. This raised frustration and concern over whether the data was being monitored sufficiently by the coaches and sports medicine staff, and if their data was being used for its intended purpose of altering training loads to reduce the prevalence of injury and/or illness. A lack of effective feedback from sports medicine staff to athletes in relation to data reported in surveillance systems has been reported previously (Neupert et al., 2022). Without receiving feedback or seeing changes in training load, athletes believed daily reporting was burdensome and pointless and therefore their reduced interest and disengagement impacted the accuracy of reported data (Duignan et al., 2019b). If sports medicine staff provided real time feedback and increased communication to the athlete regarding the values they report into the Athlete Management System, athletes would be encouraged to report more frequently and accurately. Although, feedback from staff may have been limited in some cases due to varied levels of ability to interpret athlete reported data (Duignan et al., 2019b). Communication between athletes, coaches and sports medicine staff is the cornerstone of surveillance systems, yet the processes in place for feedback appear to be failing (Duignan et al., 2019b;

Table 1
The paradox of reporting.

Sub Theme	Description of theme	Exemplar Quotes
Technological Issues	Athletes highlighted several technological issues with the mobile phone application platform which made reporting quickly after training problematic.	<i>"Quite outdated and very slow"</i> (Athlete 1) <i>"Not user friendly"</i> (Athlete 2) <i>"Confusing"</i> (Athlete 10)
Backfilling Data	The poor application performance led athletes to avoid reporting at the time of training. This resulted in information being backfilled at the end of the week on their laptop, possibly reducing the accuracy of results.	<i>"I uploaded towards the end of the week ... just used to do it all in bulk rather than do it throughout the day [or] throughout the week, just because I found it was easier that way to log them all at one time."</i> (Athlete 8) <i>"When I was good at it, [I reported at the] end of the day, or the longest it got out to, was three days. But [now] I might leave it for a good few-weeks or maybe a month."</i> (Athlete 5)
Finding Time to Report	The burden of reporting was also impacted by the limited time athletes felt they had for recovery and personal time. Several athletes described their training as a ‘full-time job’, the addition of daily reporting in a system which is unintuitive and difficult to use enhances the perceived burden of reporting.	<i>"The time when you would be doing reporting is the time when you'd be switching off, and not necessarily thinking about training."</i> (Athlete 4) <i>"Is there a point to me doing it? ..., am I just wasting my free time?"</i> (Athlete 13) <i>"it's an additional burden as like opposed to just coming home and focusing on recovery, sleep"</i> (Athlete 2)

Table 2
Data for Data's sake.

Sub Theme	Description of theme	Exemplar Quotes
Athlete Understanding	Many athletes were not aware of the rationale for self-reporting data. Athletes highlighted the sports medicine staff's lack of explanation on the reporting process and the pressure placed upon them to complete reporting.	"We just got told we had to do it ... it was just something you had to do or else your team position might be jeopardised." (Athlete 8) "I was just doing it for the sake of saying we use it" (Athlete 12) "Yeah. I didn't see too much point to it ... I don't know what it's actually used for." (Athlete 13)
Lack of Feedback	A common view amongst athletes was the data they entered was insufficiently monitored by sports medicine staff.	"The people ... on the other end that are analysing the data don't really look at it and they take a while to respond to anything that you do put in there." (Athlete 3) "If you're just reporting for the sake of reporting and the support staff aren't doing anything with it, then there's no benefit to reporting at all." (Athlete 9) "I didn't want to waste my spare time because I didn't really see any benefits from it" (Athlete 8)

Table 3
Eyes on reporting.

Sub Theme	Description of Theme	Exemplar Quotes
Mistrust in the system	Athletes were concerned regarding who had access to the data they entered in the surveillance system and felt it was necessary to provide inaccurate information when their performance was compromised.	"I probably lied a little bit just 'cause everyone sees it ... you don't want to look worse off." (Athlete 8) "[the data should] only be accessed by those [who] the athlete trusts." (Athlete 2) "The whole high-performance staff can see everything, but [the data is] not necessarily something that everyone needs to know about." (Athlete 5) "They don't understand it ... they don't know what they're actually doing" (Athlete 1)
Trust in relationships	Athletes reported their preference for discussing performance and wellbeing with their coach.	"I trust [coach] and tell him if there are any day-to-day stressors affecting my training. I tell him how I feel ... and we can program accordingly ... it's an open discussion and ideas are thrown around." (Athlete 1) "I'm quite accurate, especially since it's for [coach]'s eyes only, so I am incredibly accurate on how I'm feeling." (Athlete 3)

Neupert et al., 2022). The findings of this study emphasise this communication deficit where athletes acknowledge they are not always reporting accurately, timely, and honestly. Their belief in the lack of appropriate monitoring and subsequent inaction is prevalent and impacting on their elite sporting progress.

Trust in staff accessing reported data was considered very important to athletes when they discussed their training performance. Without knowing who was monitoring their data, athletes felt they could not report accurately due to fear of being interpreted incorrectly with potential for negative impact on their opportunities in their sport. In a study by Duignan et al. (2019b), Gaelic elite athletes were interviewed on the implementation of mobile reporting and similarly, were unconvinced their sports medicine staff had sufficient understanding and ability to use the data they were reporting. The Gaelic athletes were uncomfortable sharing personal information over concerns regarding who had access to their data (Duignan et al., 2019a); which was also shared by athletes in this study. This is of particular concern when athletes may be

including personal information (e.g., menstruation data, stress and anxiety), be underage (many athletes using surveillance systems are under 18 years) and do not know who is accessing what they are reporting (Walsh & Prowles, 2022).

The distrust in who was accessing the surveillance system was juxtaposed with the strong relationships athletes described with their coach. Athletes in this study described the relationship with their coach as built on trust and open communication, with data reported directly to the coach deemed to be more truthful than data reported into the surveillance system. The importance of the athlete-coach relationship as described by Solstad et al. (2021) supports this notion that participants value honest and responsive communication, high levels of trust, and increased motivation. The athletes were clear they would rather partake in a personal, two-way discussion with their coach about their wellbeing, how it may impact their performance, and how it could be addressed together. The lack of relationship, shared decision making, communication and transparency between the athletes and staff

Table 4
Streamlining the system.

Sub Theme	Description of Theme	Exemplar Quotes
Streamlining the System	Athletes felt the use of multiple reporting systems was cumbersome and frustrating, and an improvement would arise from having the systems synchronised together. Athletes described the amount of objective data already known to sports medicine staff they were required to report was burdensome.	"At the moment you have to spend 10 min trying to remember your set ... it's just so unintuitive." (Athlete 10) "I don't see how difficult it was just to have all the session's pre entered in and all we do is a quick rating out of 10." (Athlete 11) "The entry system needs to be better and up to more updated." (Athlete 10)
Increased feedback	Athlete compliance with reporting may be increased if regular feedback was provided regarding the data athletes were reporting.	"[If they] told us what they were using it for and provided us with feedback [it would be better]" (Athlete 9) "even if they just touch base or [said] we saw you put this in kind of thing. And then maybe I'd be more inclined to do it more often." (Athlete 13)

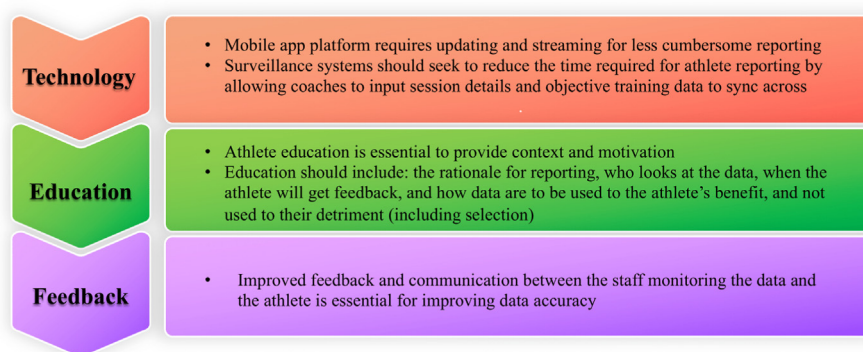


Fig. 3. Recommendations.

who monitor the reported data is a barrier to accurate and honest reporting (Duignan et al., 2019b). The inclusion of athletes in discussions regarding the interpretation and use of self-reported data in surveillance systems has improved communication and built trust between the athlete and sports medicine staff monitoring the data (Duignan et al., 2019b).

Athletes spoke of several ways self-reporting into the surveillance system could be streamlined and less burdensome within this study. Athletes highlighted the frustration of reporting data into multiple data collection systems and lack of integration and synchronisation; increasing time required to fulfil reporting expectations and increasing perceived burden. For example, elite Australian triathletes are required to report the same data within the Australian Institute of Sport Athlete Management System as well as their National Sporting Organisation surveillance system (Training Peaks®). Athletes felt the requirement to enter objective training data such as heart rate and GPS already recorded on other platforms as redundant and a waste of time, as confirmed by Saw et al. (2015a). Athletes highlighted that they could spend more time reporting accurate wellbeing data if the objective data was automatically transferred into the surveillance system (Saw et al., 2015a). The Training Peaks® platform used by Triathletes allows coaches to enter training details prior to the session and synchronises with the athlete's tracking device to collect objective data such as heart rate, GPS, distance, and time after the session (Training Peaks, 2022). Athletes are then only required to report wellbeing data, reducing the time taken to report data already known by coaches and support staff. Therefore, one athlete in the current study reported they preferred Training Peaks® for this reason.

4.1. Implication for research

Research using athlete reported data as an outcome measure may need to reconsider the validity of the measure based on the findings of this qualitative study. Unfortunately, with athletes clearly describing inaccuracies in their day-to-day athlete-reported outcome measures, research using these data may be limited, as the data used is erroneous. Future research to develop methods of data collection, which do not create undue athlete burden will likely improve data validity.

4.2. Recommendations

Recommendations to improve the usefulness and burden of athlete reported outcome measures are informed by the Saw et al. (2017) research on the implementation of athlete self-report measures. Previous recommendations by this author have been

underutilised as demonstrated by this current research and future studies should focus on the implementation of effective and efficient data capture and feedback systems (Fig. 3).

4.3. Strengths and limitations

This study included a high percentage of athletes participating in individual sports ($n = 10/13$) which may not be reflective of the experiences and perspectives of the wider team-based sport population. However, the results of this study achieved thematic saturation and themes were common amongst individual and team athletes from a variety of sports, suggesting the findings are likely reliable. A strength of this study was the number of elite Australian athletes of national and international levels who were engaged in this study, including athletes of an Olympic level. This study may be partly limited in its generalisability to other countries as the surveillance system examined is only used in Australia. Methodological choices such as combining the use of one-on-one interviews and small groups may have affected the data collected from participants. Nonetheless, the use of both techniques allowed for greater participation among elite athletes, an in-depth investigation into the experiences and perceptions of Australian elite athletes' interaction with surveillance systems and supports previously reported study findings.

5. Conclusion

Athletes perceived their experience with reporting into surveillance systems as a burden due to challenges with the application platform, time burden, and the lack of education and feedback on reported data, subsequently feeling their accuracy was compromised as a result. Athletes highlighted the communication, trust, and transparency they experienced with their coach and felt reporting could be improved by building similar relationships with the support staff monitoring the data. This study demonstrates the importance of involving athletes in the process of interpreting data to receive accurate and honest data of use in load management and injury prevention.

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Declaration of competing interest

The authors report there are no competing interest to declare.

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Appendix A. Supplementary data

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