Kitman Labs Performance Intelligence Research Initiative: A Survey to bring research on the field

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Headline

There is no shortage of topics when it comes to conducting research in Sports Science. However, whether investigations are part of typical academic research programs (e.g., Masters, PhDs) or industry-driven (e.g., Club Research and Development departments, Technology companies), their ability to transfer into the field of (elite) sports and improve substantially current practices is often limited [1-6].

This disconnection between research and practices can be attributed to the important publication constraints, that sometimes force researchers to partially compromise their work to get their paper suitable for publication (e.g., using overly-controlled study designs, favoring mean vs individual responses, cherry-picking data to have 'results') [7, 8]. The lack of clear research focus on the most relevant topics for practitioners is also often suggested as one of the first limitations for research to have an impact in the field of elite sport [1, 8]. Indeed, without clear connections between both academic and practitioner worlds [6], it is difficult for the right questions to land on researchers' desks, and appropriate research to be conducted. The consequence of this is that often, researchers are busy building the spaceship to land on the moon, while no one has asked them to go.

Surveys are one of the simplest methods to understand the need of a specific population or people with a particular role or expertise. They have advantage of being easy and quick to administer and can reach people fr-

om all over the world and different groups or organizations simultaneously. Recent examples of successful questionnaires in Sport Sciences include Delphi procedures (that include multiple rounds to reach consensus on a given topic when required) that were used to understand practitioners' current practices in terms of load monitoring [9], return to play [10] or injury prevention [11] strategies for example.

To our knowledge, however, such surveys have never been used to understand the topics of greatest interest to elite sports practitioners. By "greatest interest" we mean the topics that are believed to be 1) the most important and impactful for them to do their job successfully, while at the same time 2) remaining highly complex both in terms of implementation and gaining new insights [12].

Aim

The aim of the present manuscript is to describe the main results of an online survey conducted on a large sample of elite sports practitioners via the Kitman Labs Performance Intelligence Research Initiative. We believe that the results can help researchers to (re)define their future topic(s) of investigation, and hopefully make a greater impact on the field as a consequence.

Methods

The survey was advertised via emails to the existing company customers and on social media on October/November 2020. The survey was structured as 2 rounds.

Round 1

The first round consisted of 24 questions, including demographics and overall interest in the overall project. Practitioners were asked to rate most of the typical coaching, strength & conditioning, sport science, and medical practices in terms of importance and complexity in their context [12].

Additional questions were aimed at understanding the main barriers to implementing these practices, the challenges in those areas, and people's opinions on the relevance of injury prediction models and the use of technology in sports.

Round 2

The second round was designed to provide more details about the areas classified as both important and complex by ≥60% of the respondents in Round 1. Practitioners were provided with 8-13 sub-areas for each main topic. Only the topics that were classified as both important and complex by ≥66% (⅔) of the respondents were retained for analysis.

Data analysis

Descriptive data are presented as percentages of the total responses within the Round of interest.

Results

Demographics

Round 1 and 2 were filed within 13 and 11 min on average, respectively.

Overall, there were 183 respondents in Round 1. A large majority of the Round 1 respondents were not Kitman Labs customers (68%), had responsibilities in the areas of Sport Science (65%), Strength & Conditioning (58%), Analysis (40%), Research (38%), Medical (38%) and Coaching (25%), and work mainly in the UK (19%), USA (18%) and Australia (8%) in football/soccer (60%) and Rugby (12%) at the highest level of their sport (>60% 1st League).

Among the Round 1 respondents, 47 agreed to take part in Round 2.

Responses

Since there was no effect of job/role on the response trends of Round 1, data were pooled for all practitioners together.

The 4 areas that were the most rated as both highly important and complex to understand or implement in practitioners' context were the following (by order of importance) (Figure 1):
• Assessing injury risk from multiple variables and context (70% of respondents rating it as both important and complex)
• Fitness & Fatigue Monitoring (65%)
• Quantifying player performance and value (63%)
• Building processes for decision-making (61%)

In addition, load monitoring and injury mitigation strategies were cited with high frequency as important topics (both 60%), which possibly align and overlap with some of the above areas: load monitoring is an integral part of fitness and fatigue monitoring and is integrated into injury assessment models, injury mitigations strategies are the practical prolongation of injury risk assessment, and altogether all this helps to make better-informed decisions). As a result, those 6 main topics were selected to be further examined during Round 2 (Figure 1).

The 3 most important barriers to implementation and challenges faced for the 3 most important topics (with very similar trends for each topic) were related to (Figure 2):
1. A lack of uniform vision between colleagues
**2.** A lack of budget and manpower
3. A lack of time
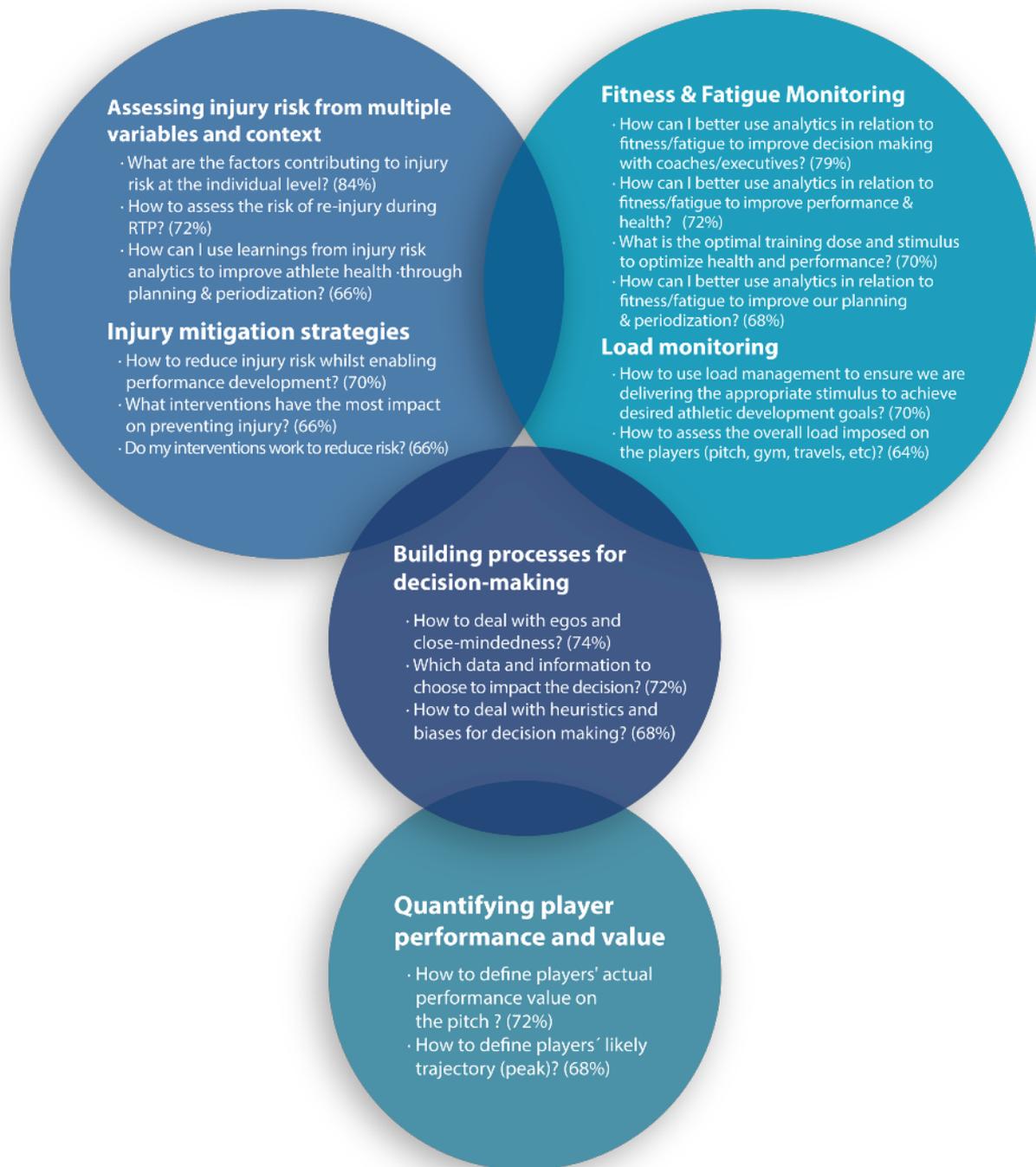
Figure 1. The six most important and complex topics in elite sports according to the panelist of respondents. The top priority sub-areas (rated as both important and complex by ≥66% (⅔) of the respondents) are also provided for each main topic. Percentages indicate the actual proportion of respondents that rated the items as both important and complex. The overlap between the different areas illustrates the fact that these are all interconnected, i.e., load and fitness/fatigue monitoring help to understand injury risk, and both serve to make better-informed decisions.
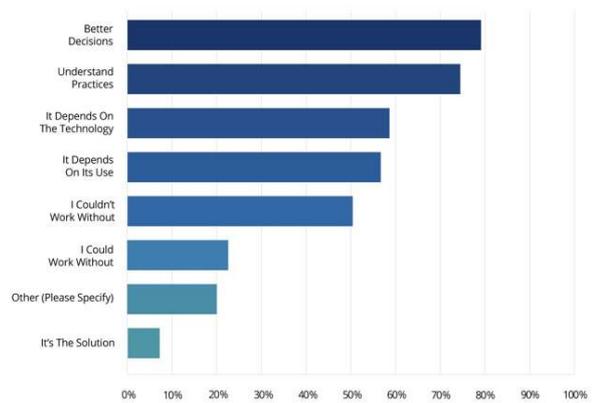
Figure 4. Respondents' opinions about injury risk assessment strategies.
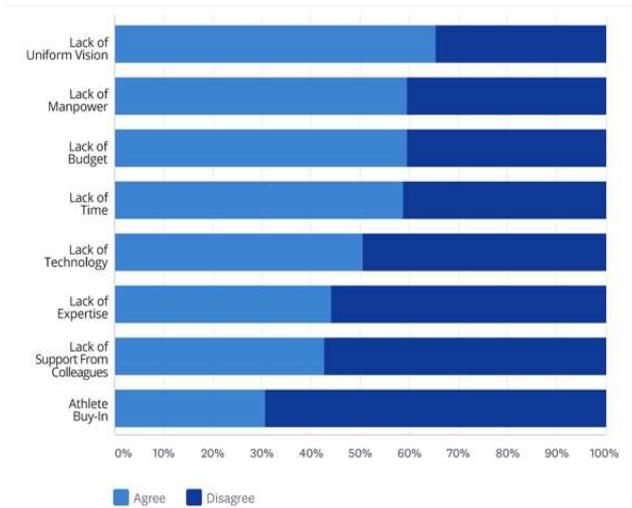
Figure 2. Challenges faced specific to the most important topics presented in Figure 1.

When asking about their position/belief in relation to injury risk assessment strategies, the practitioners' main opinion was that it has potential and is very relevant, provided the methods are appropriate (Figure 3).

Finally, when asked about their opinion on the impact that technology has in their role, practitioners responded that while technology can help them to make better decisions and better understand their practices, the overall outcome is obviously technology-dependent (Figure 4).
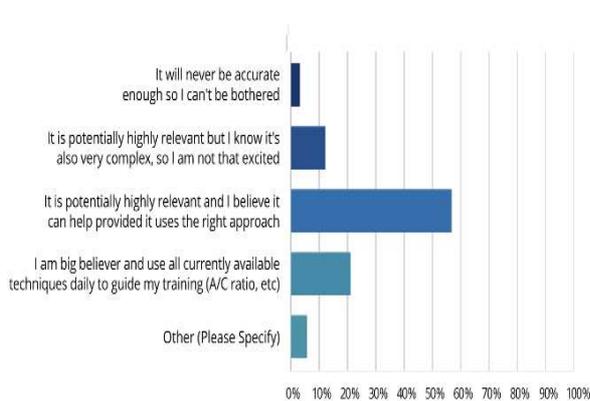
Figure 3. Respondents' opinions about technology

Discussion

There are many ways to conduct surveys, and a large number of approaches could have been used to highlight the areas to be prioritized by our Performance Intelligence Research Initiative. Based on a simple 2-axis concept [12], we decided that only topics that were believed to be both important (in terms of impact) and complex (in terms of people's ability to understand/gain insights into) should be prioritized.

The main results showed that the areas in which practitioners likely need more information and research outputs include, in order of importance (Figure 1),

1) Assessing injury risk and improving their mitigation strategies,

2) improving the monitoring of training load and responses to better understand fitness & fatigue,

3) quantifying player performance and value, and finally,

4) building optimal processes for decision-making.

Practitioners also have important expectations from technology when it comes to making (better) informed decisions. Finally, the majority of them believe in injury risk assessment techniques, as long as the analytical methods used are relevant.

The fact injuries and monitoring fitness and fatigue are ranked as the most important topics is not surprising if we first consider that keeping "players fit and healthy on the pitch" is the primary objective of any multi-disciplinary department in large organizations [13]. Along these lines, the majority of practitioners report believing in injury risk assessment strategies, provided that the relevant analytics methods are used (Figure 3). This ties up nicely with the responses shown in Figure 4, where practitioners expressed their expectations for technology to help them understand, validate/invalidate their practices, and in turn, make better decisions through evidence. In fact, using technology to directly improve processes, bring people together (1st major challenge to practitioners' job, Figure 2) to, in turn, inform decisions (the main topic ranked 4th) is an area that has been overlooked so far in Sports Science. Indeed, the focus of technology in the industry over the last number of years has been on devices, sensors, data management, visualization - not building tools to support decision making. Perhaps, the insights gathered here indicate that the focus of the next era of technology will shift its emphasis to supporting expert decision making.

Finally, the area that was ranked 3rd refers to understanding the actual value of individual players and teams. This nicely links both the performance and financial aspects together; without a proper understanding of players' value, it is obviously harder for coaches to select their best starting line-up, and sporting directors have less visibility to manage contracts. This, overall, drives the ambitions and sustainability of every single sporting organization on the planet.

Practical applications

We believe that the new insights learned from this very unique survey will help the research community focus on the most relevant and important questions, and hopefully make a better impact in the field of performance [1, 6]. To reach that goal, researchers may therefore primarily focus their efforts on:
• The analytic methods to assess injury risk from multiple variables and context, and the associated injury mitigation strategies
• Load, fitness & fatigue monitoring
• Quantifying players performance and value
• Building processes for decision-making

Taken together, these results show the need for the development of (technological) tools that optimize practitioner's time, improve their understanding of their practices via progressive analytics, drive collaboration among staff, and support the unification of the various processes involved when making important decisions both on (e.g., performance and health) and off (e.g., scouting & recruitment) the pitch.

Limitations

As with every survey, the results are directly related to the responders' profiles. Being customers of Kitman Labs for some, and all being volunteers to take part in the initiative, the panel of responders was clearly biased toward Sports Science research and analytics. A more balanced panel with practitioners with different and divergent opinions on the core aspects of Sport Science and analytics may have led to different results.

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