Author's response to reviews

Title: The perceptions of professional soccer players on the risk of injury from competition and training on natural grass and 3rd generation artificial turf.

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Author's response to reviews: see over
Dear Mr. Cenzon,

We would like to thank the reviewers for their insightful comments and for helping us improve our work. Below you will find a detailed list of responses to all the issues raised.

The paper is well written and easy to follow. The aims of the study are clearly laid out. The overall concept of this article and its design is interesting and original.

We thank the reviewers for their positive comments!

**Major Compulsory Revisions**

The rationale should be stronger/explained more clearly. You state that research to date has shown comparable injury rates on surface, why then do you want to study specifically the perceptions of players e.g. to reduce the gap between practice and science? Why is this important to you and to the professional soccer population?

We have expanded on the rationale further and explained why this study is important.

In the discussion of your findings it is not clear what implications they have for future research and what the practical applications are. There should be a more consistent flow to this section with clear interpretations and applications provided based on your findings.

We have expanded on directions for future research based on our results and included a section for practical applications based upon our findings.

The response rate is low and should be mentioned as a limitation and therefore the generalizability of your results is impacted. For example, 6 teams from 18 in the league corresponds to 33.3%. Also according to the number of players the representation of the league as a whole is low. You state that for 6 teams there were a possible 180 players, if we say on average 30 players per team this would mean from the league as a whole there are 540 players (18 teams x 30 players) meaning that your response is made up of only ~18% of the players of the entire league. This should be stated and taken into account in the interpretation of your...
We have included the response rate for the teams (33%) in the results and expanded in the discussion to state that this was a limitation and that our results may not be representative of all players in the MLS. We have taken this point into consideration throughout the discussion section.

A main challenge with this study is how the finding shed new light on the issue if the type of surface affects injury risk and physical loading. In the introduction, a better foundation should be presented what the affects of the players’ (subjective) impression of risk is. This is particularly important as most research seems to show that no large risk differences exist between NG and FT.

In the introduction we have included all the current studies that include subjective impressions of professional and elite players perceptions of artificial turf when compared to grass. It is impossible to speak on the “affects of players (subjective) impressions” as this research has not been conducted, and we do not wish to speculate. We have indicated the rationale for our study clearly and stated why we wish to analyze players opinions even though the current studies show no large risk differences between FT and NG. In the discussion section we expound in detail how our findings shed new lights on the issue of surface and injury and put our findings in the context of current studies.

Methodologically a strong bias is introduced by the selection of players. The vast majority has most training and playing experience on natural grass. Thus, it is not surprising that they prefer this type of surface. It would have been a great improvement if players who have most experience on artificial turf would have been included. This may be hard or impossible to do, but at least the authors should, on the current dataset, analyse the relationship between FT/NG experience and survey response. A start may be to consider team 1 who train on FT. Furthermore, this bias in the selection of participants and the consequence for interpretation should be discussed in detail. Note that the bias I mention here is another one than the bias discussed (bottom 1st page of discussion) in your paper.

We agree that including players who played and trained regularly on FT would have been ideal but this was not possible due to the constraints surrounding which teams could participate. We have addressed the bias that could have arisen as a result of a majority of the players’ playing/training consistently on grass.

**Minor Essential Revisions**
Given recent research on different types of 3rd generation turf (e.g., McGhie and Ettema) it may be a good idea to specify in more detail the turf specifications of the turf that is used most frequently.

We realize the importance of specifying the various technical specifications of the various types of 3rd generation turfs but we were unable to attain this information for this study. Furthermore we feel that we would not be adding any additional information or providing any clarification to our findings by going into detail regarding specifications for various types of 3rd generation turfs.

You change between ‘athletes’ and ‘players’, please harmonize and use ‘players’ throughout the manuscript.

This has been amended

Please specify non-contact injury as you found that contact injury was not perceived by players as having an increased risk.

We have made this change to the abstract and clarified this point throughout the paper.

First sentence: ‘Soccer is...interest in the sport’. This does not have relevance to the topic and you could open the article with a bigger impact. I would suggest to open the article (introduction) with ‘the impact and or/prevalence of injuries in soccer and that it is important to understand the risk factors for injury in order to reduce them.

We have changed the introduction to be more relevant and impactful

Paragraph 1; Line 3: ‘Currently, two types of surfaces are sanctioned by UEFA and FIFA’. Is this up to date as of the present date? What about the 4th Generation

We have recognized that there is now a 4th generation of turfs and that these are sanctioned under FIFA rules.

Paragraph 2; Line 4: ‘Notably missing in this body of literature.......’ This should come later in the introduction when you are justifying the rationale for your survey and leading into the ‘purpose’ of your study.

We believe that the positioning of this statement is acceptable. Thank you for your suggestion.

Paragraph 3; Line 7 ‘However, Nedelec et al.... In the paper by Nedelec et al. the subjects/players were accustomed to training on artificial turf. This
may be worth stating and taking into consideration later in the discussion and interpretation of your results.

*We have discussed this point in detail in the discussion section.*

Participating players had to speak or read English, were any players excluded as they did not meet this criterion? If so, how many were excluded?

*Data collection was executed by the medical staff of each respective team and they had the discretion to exclude players based on their judgment of an athletes competency of the English language. We do not know if any players were excluded and if so the frequency as we did not collect this information from the medical staff.*

Please state how many questions were closed and how many were open, also how many were statements.

*We have included this information.*

You state that 10% of data was missing. Can you specify which questions and how many answers were missing for each question.

*I erred in my calculation of missing data and in presenting the correct amount of questions analyzed. I mistakenly included the missing responses for Question 3 (Q3) as missing data when in fact this data was not missing. The players who did not provide responses for Q3 were instructed to move on to Question 5 (Q5) because their response to Question 2 did not meet the prerequisite choices to move on to Q3.*

*All players who had moved on to Q3 because they met the response prerequisite for Q2 provided responses (67/99 players). There were 32 players who were instructed to move on to Q5, and I erred in including these missing responses for Q3 in the missing data count. I amended this error and this is the reason why the frequency of missing responses has dropped from 88 to 48.*

*Furthermore I made a mistake when reporting the number of questions analyzed (8). There were 13 questions analyzed (2 of which had an associated open-ended component).*

*I included the frequency of missing responses for each questions in the summary of responses in the body of the results.*

Please report if no significant differences were found between subjects from different teams (in terms of anthropometric, age data ...).
We tested associated between 3 variables using a chi square test found no significant differences between the 3 variables and all the questions analyzed. P Values ranged from 0.150 – 0.888.

You should state in the methods section that players were prompted to recall their experiences on 3rd generation and that you provided a detailed description of this type of turf in your survey. It is an important point as the reader could be left wondering if all players are recalling experience on the same artificial turf or some are thinking about the new type or old types.

We have included this information

First sentence – you cannot generalise ‘players from North America’ as you only had a sample of approximately 18% of the professional players in North America. You do not know if this reflects the perceptions of all of the players. Please amend to show that the findings indicate that a selected group of professional soccer players.....'

We have made the appropriate changes.

Please explain how the mechanisms by which the 3 identified surface mechanical properties may be able to affect injury risk.

We have included this information

Paragraph 2; Line 8 to 14: ‘Interestingly.....likely to occur on FT. It is not clear why this finding is ‘interesting’. Please rephrase the paragraph to make it more clear for the reader.

We have rephrased the paragraph.

Paragraph 3: Line 4: You write that it would be interesting to see if these findings extend to other sports. I think first of all it will be interesting to see if these findings extend to the wider soccer population as your sample is low and will need to be validated with larger sample size and from other football leagues.

We agree that we need to take this point into consideration and have made that appropriate changes.

Paragraph 3; Line 6: ‘The evidence suggests .... Have not been captured in the current literature’. This may be one possible scenario but the low sample in your study does not make it possible to claim that the ‘evidence suggests this’. Although your findings are interesting the evidence is still
weak and needs to be strengthened with further research to see if this is indeed the case.

_We have rectified our usage of the word “evidence” and recognized that it is our findings that suggest this and not the current evidence._

Paragraph 4; Line 1: Please reference the literature that has found these mechanical properties to affect aetiology of injury.

_We erred in making this connection. What we meant to imply was that these are the “risk factors” that have been identified to possibly modify surface related injury._

Paragraph 5; Line 5. There is not enough evidence to state that proper maintenance of artificial turf could reduce the risk of surface related injury. Even if this makes common sense I think according to the evidence to date, it could be recommended to maintain both artificial and natural surface, and that perhaps the risk of non-contact injury and quality of surface should be verified.

_We again have rectified our incorrect usage of the word “evidence”_.

Paragraph 7; Line 5; You state that the findings may not be able to be extended to other populations. Please state the limitation of your sample size and that it may not represent the professional elite male soccer population as a whole. And that further research needs to be also performed in this group (as outlined in ‘general comments’ section).

_We have stated this limitation._

Please specify that artificial turf was related to non-contact injury. As your findings showed contact injury risk was not perceived to be higher on artificial turf.

_We have made the appropriate change._

The link for reference number 2 does not exist anymore. Please update this with an up to date link

_We have updated the link._