Reviewer's report

Title: Association between sensory function and medio-lateral knee position during dynamic tasks in patients with anterior cruciate ligament injury

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Reviewer: Chris Whatman

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Review – BMC Musculoskeletal

Manuscript: Association between sensory function and medio-lateral knee position during dynamic tasks in patients with anterior cruciate ligament injury

General comments:

There seems good rationale for this study based on the previous work in this area and this is a topic that should be of interest to therapists working with ACL injured clients. While the question posed is clearly presented the entire paper would benefit from proof reading to correct the many minor grammatical errors. I would specifically suggest avoiding use of the term “elucidate” – this is an unnecessarily elaborate term – replace with “evaluate” or “investigate” or similar throughout.

While the methods are appropriate there are areas that need further clarification/justification and the statistical analysis needs further justification (or at least there needs to be further acknowledgement of limitations in the approach used). The results need careful review to ensure the authors are appropriately interpreting the findings. As it currently reads I feel the authors are overstating the findings of the study in the discussion/conclusion and this needs further review and justification – specific comments below.

Specific comments indicating necessary revisions (line indicated where appropriate):

Abstract:

28 – the use of the term “influence” in the objective implies possible cause and effect which the study design obviously doesn’t allow – replace with “association” as in title.

40, 41 – add to the method that you analysed for male v female differences.

43 – review and edit results after consideration of comments in results section below.

48 – review and edit conclusion after consideration of comments in results section below.
Background:

The background provides good rationale for the study.

65 – both 3D and 2D motion analysis can’t be the gold standard – I suggest 3D is the gold standard for motion analysis – please edit.

68 – the authors need to be more cautious in statements re the reliability and validity of visual ratings of knee position during functional tasks – some methods have been shown to be more reliable than others and acceptable clinical reliability is not well defined (the cited Örtqvist et al. study for example reported only moderate reliability) and validity is also variable depending on the study and type of validity investigated (the cited Ekegren study reported their technique did not have sufficient sensitivity and specificity to be considered valid) – please edit this statement to give a more balanced view or be more specific/justify this statement.

Methods:

103 – time since injury and reconstruction also look longer in men than women?
111 – why barefoot for some tests and shoes for others? Please justify? Could this have influenced the proprioception, kinesthesia during the dynamic tasks? Is this a possible limitation of the study?
123 – please clarify which styloid process was used?
129 – please add the actual reliability (ICC or SEM) from the studies referenced.
142 – how did subjects “indicate” when they felt movement?
144 – why use the median value? Please justify using median rather than mean. Did you examine the reliability of the TDPM measure? Please include if you did – if not this is a further potential limitation needing acknowledgement.
149 – were visual ratings made in real-time by the 2 raters independently? If so how were disagreements dealt with? Please provide more detail to clarify.
153 – “talocrural joint” – was this the mid-point of joint? or do you mean mid-point of the malleoli as has been reported previously? Please clarify.
153 – please clarify the definition for “fair” movement quality. Also how did you rate a subject if the knee moved lateral to the foot?

Did you examine the reliability of your movement ratings? If so please report – if not again is this a potential limitation?

Statistics:

Why did you calculate correlations and differences in means, it seems they are just different ways of answering the same question? Why not just use the most appropriate for the study question? – please justify.

Was there any basis for the sample size used in the study? Specifically did you have enough subjects to analyse men and women separately?
164 – on what basis did you decide there was no relationship between
demographics and knee position? Please clarify?

Given you dichotomised the visual ratings why didn’t you just use a
dichotomised rating in the study? Previous authors have suggested
dichotomised ratings are the most reliable.

173 – what is meant by “exploratory character” – and is this justification for
making multiple comparisons? – you should at least acknowledge this as a
limitation so readers are aware. Would it be more appropriate to use ANOVA?

Including confidence intervals and/or effect sizes for all your outcome statistics
would significantly improve the reporting of results – I strongly recommend you at
least consider the inclusion of confidence intervals given the question of
adequate sample size.

Please include the threshold for statistical significance – if this is what you based
your inferences on.

Results:

179 – what test was used for making this inference? Your statistics don’t appear
to include a suitable test for differences in categorical variables.

179 – “functional task” versus “dynamic tasks” – please be consistent throughout
with the terminology.

183 – you report two correlations – one is statistically significant (based on p #
0.05) and one isn’t – this is confusing – please clarify? You should also include
the p values in the bracket in the text e.g. (r=0.423, p=0.044). Please also
comment on the magnitude of these correlations – these are likely considered
only moderate by most authors. Correlations and p values better presented to
only 2 decimal places – please edit throughout.

183 – edit to include underlined words that follow “….was associated with KMFP
with descending……..”

184 – you report an association in women based on a correlation that ranges
from –ve to +ve and a range of significant and non-significant correlations (based
on p # 0.05) – this is confusing and seems poor interpretation of the findings –
please justify/review.

188 – again your results don’t appear to support this stated difference in women
– not all vibration sense measures in women during stair descent and lunge were
significantly different (only 3 of 6 measures were) – you need to be more specific.

189 - please also state the difference not just the p values.

189 – I think you are referring to Figure 3, not Figure 2? – please check.

191 – how did you calculate 40% worse kinesthesia? Needs more detail and
clarification and please also clarify what you mean by borderline statistical
significance.

192 – again I don’t think you should be referring to figure 2c-d? – confusing –
needs checking.
Again I’m concerned re the lack of balance in the interpretation of the findings, especially regarding non-significant results – while not statistically significant some subjects with KMFP performed better on the VPT and TDPM tests?

Discussion:

195 – do your results really support this statement? You have a significant correlation for men only (of moderate magnitude) and you don’t have a statistical difference between good and poor movement groups for men or women? Please review and justify.

197 – again I can’t see what this strong statement is based on – please justify based on your findings. You certainly haven’t analysed for “clear associations”- to do so you would need to report confidence intervals for you correlations.

200 – you found this correlation for men but there was no significant difference in TDMP for men with good or poor movement in the drop jump – please comment.

206 – statistical significance cannot be interpreted as clinically relevant, suggest deleting this statement – to assess clinical relevance you need to report the magnitude of the outcome and the confidence interval, with appropriate interpretation – (you really need to report the confidence interval for the correlation so readers can appreciate the uncertainty in your outcome given the small sample size).

215 – this paragraph refers to several studies investigating the ACL hamstring reflex – is there good rationale for how this reflex may influence medio-lateral knee position?

232 – some have suggested that slower movements such as the single leg squat and stair descent require more control.

240 – again I don’t think your evidence strongly supports this statement – please review and justify.

242 – again your analysis doesn’t allow you to comment on how “clear” the associations were – please edit – or better add confidence intervals so readers can actually see the uncertainty in your findings.

250 – seems a little concerning that in high level athletes 9-16 months after injury so many still had a KMFP in these relatively simple tasks?

Additional limitations:

Along with additional limitations noted above please also comment on multiple comparisons and the likelihood that some of the statistical correlations and differences are chance findings.

Please also comment on the considerable variability in time since injury/reconstruction in the sample – could this have influenced the results?

Conclusions:

I don’t think your findings support such a strong conclusion – please review interpretation of results and edit conclusion to provide a more balanced summary
of the findings.

279 – you didn’t test “hop” tests – please review.

Tables and Figures:

Table 2 needs editing for grammar and please justify in the method why you used the second landing in the drop jump.

Tables 3,4,5 – please indicate significant findings with an * (and state threshold for statistical significance).

Figure 4 a-b is not referred to anywhere in the text of the paper?

Why are the VPT and TDPM findings in figures 3 and 4 presented as median and quartiles whereas the same findings in table 5 are presented as mean and SD?

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests