Reviewer’s report

Title: Validation of a novel Kinect-based device for 3D scanning of the foot plantar surface in weight-bearing

Version: 0 Date: 05 Jul 2019

Reviewer: Nathan Collins

Reviewer's report:

Thank you for the opportunity to review your article.

I have provided feedback below.

Kind regards,

Nathan Collins
La Trobe University

Page 2, Line 34:

The word 'dealt' seems inappropriate here, at least in the Australian use of English. I wonder if the word 'managed' may be a more appropriate word as it evokes a more clinical focus.

Page 2, Line 44 and 46:

This sentence has low readability, recommend:

The aim of this study was to design and validate a novel 3D foot scanner based on the Microsoft Kinect sensor, allowing a 3D scan of the plantar shape of the foot to be acquired in weight-bearing.

Page 2, Line 56:

Insert a 'The' at the start of the sentence to improve readability.

'The' accuracy and repeatability…..
I would argue that there is not an increasing interest in personalised orthotic devices, as custom made devices have been made for decades (if not longer). I suspect your message here is that there is an increasing interest in using 3D scanning and additive manufacturing to make orthotic devices. The reference that you have used discusses this change in fabrication technique. This sentence state this more clearly.

The correct terminology in this context would be 'orthoses' rather than 'orthotics'.

't…..is critical to designing custom orthoses and footwear….'

Terminology: 'sportsmen' is gendered language and should only be used if referring male athletes only. Recommend a change to 'athletes':

't….. and athletes (4), to patients…….'

Terminology: 'diabetic patients' defines the person by their illness. 'patients with diabetes' is better language. Recommend:

'… such as patients with diabetes (6,7).'

Delete 'foot' to improve readability.

'the medial longitudinal arch, the foot most notable…….'

Correct terminology here would be 'orthoses' rather than 'orthotics'.
I have a few issues with this sentence and paragraph. I think this section needs to be re-written. Obviously, you have chosen to use a full-weightbearing scan in your study, you need to very clearly explain why you chose to do that. The justification is currently not clear.

A few points to consider:


Although Tsung et al did find the non-weightbearing cast reduced plantar pressures, the peak pressure was reduced the most by the semi-weightbearing cast. Would this have been a better casting position to use in your study?

Do you have a reference to support this statement? Anecdotally I would suggest that plaster casts very rarely model the foot in weightbearing (at least in Australian clinical practice).

A definitive statement such as this should have a reference. Has the difference between foam boxes and 3D scans been investigated? (In Australia it is very common for clinicians to take a foam boxes and scan it using a sensor scanner. This is done to capture a semi-weightbearing posture (primarily based on the work of Tsung et al (2004) and Guldemon (2206))

The final sentence of this paragraph starts with 'Therefore', implying a link with the previous sentence, however the previous sentence does not refer to traditional casting methods.

This sentence is also incorrect, although plaster is not often used to capture a full-weightbearing posture, it can used for this purpose.

This sentence is very long with poor readability. Consider a re-write to clarify the key purpose of the sentence.
Page 6, Line 14:

The Foot Posture Index does not use the terminology: flat, rectus, and cavus, instead it uses the terminology 'pronate' 'normal' and 'supinated'. Considering your reference is Redmond et al (2008), I would recommend using their terminology.

Page 7, Line 18-20:

See note above regarding common terminology (pronated, normal, supinated) in the published literature.

'Exemplary' is often interpreted as mean 'perfect' and 'flawless'. I wonder if 'sample' may be a more appropriate word here.

Page 7, Line 25 - 30:

'Arch depth' is not a measurement I have seen before. Based on your description I wonder of 'Arch width' is a more accurate description? I'm happy for this comment to be ignored.

Page 7, Line 58:

Insert 'an' into this line:

'…resulted in an inter-subject average…..'

Page 8, Line 47:

Readability will be improved by inserting 'all':

'….was observed across all trials.'

Page 9, Line 53-55:

See note above regarding common terminology (pronated, normal, supinated) in the published literature.
This sentence refers back to the Background section where you state an issue with current scanners is that they don't allow weightbearing scans. I think it is important that you clearly state why this is an issue. Most clinicians don't want to take full-weightbearing scans, so your justification here needs to be very clear.

Insert 'a' into the sentence to improve readability:

'…applications of such a device…'

Readability issues. Switch the words 'allow' and 'also'.

'This should also allow…..'

Terminology here should be 'orthoses' rather than 'orthotics'.

Suggest deleting the word 'preliminary'.

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Please indicate how interesting you found the manuscript:

An article of limited interest

**Quality of written English**
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published
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