

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

This paper was submitted to a another journal from BMJ but declined for publication following peer review. The authors addressed the reviewers' comments and submitted the revised paper to BMJ Open. The paper was subsequently accepted for publication at BMJ Open.

(This paper received three reviews from its previous journal but only two reviewers agreed to published their review.)

ARTICLE DETAILS

TITLE (PROVISIONAL)	International normative data for paediatric foot posture assessment: a cross-sectional investigation.
AUTHORS	Gijon-Nogueron, Gabriel; Martinez-Nova, Alfonso; Alfageme-Garcia, Pilar; Montes-Alguacil, Jesus; Evans, Angela Margaret

VERSION 1 – REVIEW

REVIEWER	Ana Claudia Mattiello-Svezut Ribeirão Preto Medical School University of São Paulo - Brazil
REVIEW RETURNED	28-Jun-2018

GENERAL COMMENTS	<p>The manuscript presents a study with typical children and adolescents that seeks to describe normative data of FPI. It represents a compilation of data obtained from Spain (largest number of children), Australia and UK, which aggregates 3217. The authors also correlate FPI with BMI and age and sex. The authors performed sophisticated statistical analysis and pointed out that pronated feet should be considered as "normal" for a wide range of normal variation. However, the number of volunteers who composed the most critical ages of childhood (3-7 years) to classify the different types of feet are significantly lower than the others (mainly from 3 to 5 years). For this reason, the categories of FPI are weak and unconvincing.</p> <p>Minor comments: Abstract: (Results) The information of mean FPI is not essential. The authors could present the frequency of categories observed for FPI following the methods described by Martínez-Nova et al., 2018. The term "non-flatfeet can include all types of feet as high-supinated, supinated and normal. This description is not interesting for feet clinical and researchers. (Conclusions) It is not possible to follow the conclusion raised by the authors using the results described here as "supinated foot posture is abnormal finding...years." Strengths and limitations... It is difficult to understand that "pronated foot as the normal foot posture..." What is normal? Do you mean healthy or typical for the age?</p> <p>Introduction: This section was built showing there aren't any study qualifying feet in typical children and adolescents. It is not the real (Martínez-Nova et al., 2018; GijonNogueron et al., 2016; Carvalho</p>
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et al., 2017; Redmond et al., 2008). Maybe, the authors could show positive and negative aspects of the paper and demonstrate the relevance of their study.

Methods: a) How many people acquire these data? How many people calculated the FPI? Do you have reliability between the examiners? Please, show us the data. b) How can you know that the volunteers were "healthy"? Did you use any questioner? Please, explain how did you include or excluded the volunteer? It was based on what? c) Where were the volunteers invited to participate in your study (schools, churches, etc.)? Where did you acquire the data (in the schools, in your lab, in the church, etc.)? d) Please, describe if the examiners that acquired the data were the same that evaluated the results. e) Regarding FPI, please explain how did you evaluated the anatomical prominences and if you used observational and/or palpatory measures. The authors described that the classification of BMI was done using Spain and Australian survey. How about UK children? Did you use any other survey? Please, explain it. f) Why did you introduce patient involvement"? Is it a mandatory condition of the journal? g) I can understand the statistical methods adopted to understand your data, but I would ask what the author think about the absence of normal distribution of the data? Is it indicating a limitation of your study?

Results: I can understand that you have a lot of results to describe. However, I don't like your description. In my opinion, as a clinical professional that could use your normative data, it would be essential to show the frequency of distribution considering different scores obtained by age and sex. I couldn't understand why you didn't use the classification proposed by Redmond, Crosbie, and Ouvrier, 2006; Redmond, Crane, and Menz, 2008 or Martínez-Nova et al., 2018. The data presented in Table 2 is relevant but it is not pleasant for the readers. When we ask a normative data, we want to know if (and how much) the child that we are evaluating is "normal" or different of the typical ones. Or considering your study, if one child is classified with a foot supinated, is it expected by how many children of the same age and sex. Please, observe how interesting is the data presentation produced by Martínez-Nova et al., 2018. Maybe. The authors can present some tables as supplementary data, which could be interesting when we need to check the "numbers".

In this item, the description of the Tables 2, 3 and 4 and Figure 1 should be accompanied with the authors' analyses. The most interesting correlation showed in the results is between BMI and FPI, but when you explore the association between the ranges of the FPI.

Discussion: I am not convinced that the data obtained between from 3 to 5 years represent a good number of the volunteers which attest an appropriated distribution of FPI to be described as NORMATIVE DATA. Please, take care with the terms: "pronated as normal".

Conclusion: In my opinion, the authors should present a short conclusion. The present conclusion seems like a brief description of their results associated with discussion. I suggest removing the last phrase (It is not a novelty to describe that supinated foot in children less than five should be considered abnormal and all clinicians know that highly pronated and supinated foot is an alert).

	<p>Limitations: I do not agree with this "A further limitation is the disproportionate numbers of children within each age year group, although this is pragmatically ameliorated to an extent as midchildhood, a time a frequent parent concerns, is best represented" As I described early, this phase (3-7) is the most critical phase to qualify the foot and the number of volunteers is not representative of that. It means that your justification is not appropriated.</p>
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REVIEWER	<p>Helen Banwell University of South Australia, Australia</p> <p>The final author (Angela Evans) was previously employed by the University of South Australia and lectured within my department. This employment ceased a minimum of 10 years ago with no regularly contact held since.</p>
REVIEW RETURNED	02-Jul-2018

GENERAL COMMENTS	<p>Thank you for the opportunity to review this article. This study undertook cross-sectional analysis of existing dataset of healthy children aged 3 – 15 years in regarding to determining foot posture using the foot posture index – 6 item (FPI-6) and body mass index (BMI). This work is of interest and is timely. If conducted well, such a large-scale investigation will inform ongoing debate and understanding of the developing foot. Nevertheless, this manuscript requires further attention prior to being recommended for publication.</p> <p>The introduction requires more depth and balance. Whilst the goal of an introduction is to establish the gaps in evidence, several key 'knowns' are not discussed, which under reports the current knowledge regarding 'paediatric flat foot'. These knowns include the authors previous work on establishing normative values for the FPI, other large population studies such as Pfeiffer 2006, Uden 2017 etc. and existing recommendations on when and why intervention may be beneficial (Rome et al, 2010, Evans pFFP, Harris, Dars systematic review (PloSOne 2018)) which makes statements such as those in Line 32 (clinicians make decisions based on their personal clinical experience) incorrect. The final paragraph of the introduction could also be a more critical review of the FPI, including more robust evaluations of its reliability and validity for use in paediatrics (Banwell et al. 2018).</p> <p>The methodology also requires expansion and clarification. The dataset descriptions do not allow the reader an adequate understanding of the characteristics of the participants nor the recruitment process. Was the dataset only sourced from the authors previous work? Were other authors approached to supply data? What were the participants specifically recruited for? Was there any indication of the reliability of those measuring the data within the studies of recruitment? If it is the authors own dataset what is gained by this study (other than the amalgamation of data) that was not previously answered through the three separate studies conducted? If it is only the authors data, this needs to be strongly addressed as a limitation. BMI calculations appear to have been based on two separate measures and then re-classified. I would recommend attention to how this is explained within the text. There is no mention of gender of the sample prior to the results. Furthermore, the exclusion criteria does not specific 'inflammatory' disorders, which would presumably impact on the ability to evaluate the FPI.</p>
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	<p>Results: the results indicate that 33.7% of children were found to have 'flatfeet' based on a classification of equal or greater than +6 on the FPI. Yet there is nothing mentioned previously to base this on, and whilst correct, directly contravenes line 14 of the introduction where it states there is no agreed reference for classifying flat foot. Furthermore, why are the UK and Australian children analysed together in reference to differences in country. This needs to be explained in data management.</p> <p>Given the concerns observed to this point I have not reviewed the discussion section closely. It would be recommended on brief review that the authors need to clarify whether or not the reasons these outcomes concur with the previous studies is if they indeed included the same participants (Line 49 page 9 and line 4 page 10) and references are needed for live 6 page 10.</p> <p>Other recommendations:</p> <p>Would consider adding the words paediatric, Foot posture index, flat foot to the key words</p> <p>Please identify the foot posture index as the 'six item' version at the first mention. This will reduce reader confusion from the original 'eight item' FPI.</p> <p>Line 37 of methods – please correct 'talus-scaphoid' to 'talonavicular' accordingly.</p> <p>In conclusion, this manuscript would benefit from further development and consideration of the participant characteristics prior to being accepted for publication.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Ana Claudia Mattiello-Sverzut

Institution and Country: Ribeirão Preto Medical School, University of São Paulo - Brazil

Please state any competing interests or state 'None declared': none to declare

Please leave your comments for the authors below

The manuscript presents a study with typical children and adolescents that seeks to describe normative data of FPI. It represents a compilation of data obtained from Spain (largest number of children), Australia and UK, which aggregates 3217. The authors also correlate FPI with BMI and age and sex. The authors performed sophisticated statistical analysis and pointed out that pronated feet should be considered as "normal" for a wide range of normal variation. However, the number of volunteers who composed the most critical ages of childhood (3-7 years) to classify the different types of feet are significantly lower than the others (mainly from 3 to 5 years). For this reason, the categories of FPI are weak and unconvincing.

See attached file for full comments.

General comments:

The manuscript presents a study with typical children and adolescents that seeks to describe normative data of FPI. It represents a compilation of data obtained from Spain (largest number of children), Australia and UK, which aggregates 3217. The authors also correlate FPI with BMI and age and sex. The authors performed sophisticated statistical analysis and pointed out that pronated feet should be considered as "normal" for a wide range of normal variation. However, the number of volunteers who composed the most critical ages of childhood (3-7 years) to classify the different types of feet are significantly lower than the others (mainly from 3 to 5 years). For this reason, the categories of FPI are weak and unconvincing.

We have include this problem in the limitation paragraph

Minor comments:

Abstract: (Results) The information of mean FPI is not essential.

We have removed this information and writing only the frequency

The authors could present the frequency of categories observed for FPI following the methods described by Martínez-Nova et al., 2018. The term "non-flatfeet can include all types of feet as high-supinated, supinated and normal. This description is not interesting for feet clinical and researchers

He have changed this paragraph to be more clarify with term normal, pronated and supinated

(Conclusions) It is no possible to follow the conclusion raised by the authors using the results described here as "supinated foot posture is abnormal finding...years."

We have been more concrete with the term non-flat feet and the use of new word more clarify"

Strengths and limitations...

It is difficult to understand that "pronated foot as the normal foot posture..." What is normal? Do you mean healthy or typical for the age?

We have removed this point

Introduction: This section was built showing there aren't any study qualifying feet in typical children and adolescents. It is not the real (Martínez-Nova et al., 2018; Gijón-Nogueron et al., 2016; Carvalho et al., 2017; Redmond et al., 2008). Maybe, the authors could show positive and negative aspects of the paper and demonstrate the relevance of their study.

We have included new paragraphs with new information and trying improving the quality of background of the paper

Methods: a) How many people acquire these data? How many people calculated the FPI? Do you have reliability between the examiners? Please, show us the data. b) How can you know that the volunteers were "healthy"? Did you use any questioner? Please, explain how did you include or excluded the volunteer? It was based on what? c) Where were the volunteers invited to participate in your study (schools, churches, etc.)? Where did you acquire the data (in the schools, in your lab, in the church, etc.)? Please, describe if the examiners that acquired the data were the same that evaluated the results. e) Regarding FPI, please explain how did you evaluated the anatomical prominences and if you used observational and/or palpatory measures. The authors described that the classification of BMI was done using Spain and Australian survey. How about UK children? Did you use any other survey? Please explain it. f) Why did you introduce patient involvement"? Is it a mandatory condition of the journal? g) I can understand the statistical methods adopted to understand your data, but I would ask what the author think about the absence of normal distribution of the data? Is it indicating a limitation of your study?

We have tried to answer all your doubt of the method, we hope that you think that it is enough information to improve the quality of paper

Result: I can understand that you have a lot of results to describe. However, I don't like your description. In my opinion, as a clinical professional that could use your normative data, it would be essential to show the frequency of distribution considering different scores obtained by age and sex.

We have include a new figure 1 frequency total of FPI, Figure 2 frequency by gender and

the figure 3 by age (but this figure it was) and Figure 4 by BMI category versus FPI category

I couldn't understand why you didn't use the classification proposed by Redmond, Crosbie, and Ouvrier, 2006; Redmond, Crane, and Menz, 2008 or Martínez-Nova et al., 2018.

We have used this classification now

The data presented in Table 2 is relevant but it is not pleasant for the readers. When we ask a normative data, we want to know if (and how much) the child that we are evaluating is "normal" or different of the typical ones. Or considering your study, if one child is classified with a foot supinated, is it expected by how many children of the same age and sex. Please, observe how interesting is the data presentation produced by Martínez-Nova et al., 2018. Maybe. The authors can present some tables as supplementary data, which could be interesting when we need to check the "numbers

We have include more figure to improve the compression

In this item, the description of the Tables 2, 3 and 4 and Figure 1 should be accompanied with the authors' analyses.

We have included new paragraphs with more information about these tables

The most interesting correlation showed in the results is between BMI and FPI, but when you explore the association between the ranges of the FPI.

We have a included a new figure to show this

Discussion: I am not convinced that the data obtained between from 3 to 5 years represent a good number of the volunteers which attest an appropriated distribution of FPI to be described as NORMATIVE DATA. Please, take care with the terms: "pronated as normal".

We have included a new text in the limitation with this suggestion, we have been more specific with this

Conclusion: In my opinion, the authors should present a short conclusion. The present conclusion seems like a brief description of their results associated with discussion. I suggest removing the last phrase (It is not a novelty to describe that supinated foot in children less than five should be considered abnormal and all clinicians know that highly pronated and supinated foot is an alert).

We have removed this phrase

Limitations: I do not agree with this "A further limitation is the disproportionate numbers of children within each age year group, although this is pragmatically ameliorated to an extent as midchildhood, a time a frequent parent concerns, is best represented" As I described early, this phase (3-7) is the most critical phase to qualify the foot and the number of volunteers is not representative of that. It means that your justification is not appropriated.

We have modified this paragraph and remove this part

Reviewer: 2

Reviewer Name: Helen Banwell

Institution and Country: University of South Australia, Australia

Please state any competing interests or state 'None declared': The final author (Angela Evans) was

previously employed by the University of South Australia and lectured within my department. This employment ceased a minimum of 10 years ago with no regularly contact held since.

Please leave your comments for the authors below

Thank you for the opportunity to review this article. This study undertook cross-sectional analysis of existing dataset of healthy children aged 3 – 15 years in regarding to determining foot posture using the foot posture index – 6 item (FPI-6) and body mass index (BMI). This work is of interest and is timely. If conducted well, such a large-scale investigation will inform ongoing debate and understanding of the developing foot. Nevertheless, this manuscript requires further attention prior to being recommended for publication.

The introduction requires more depth and balance. Whilst the goal of an introduction is to establish the gaps in evidence, several key 'knowns' are not discussed, which under reports the current knowledge regarding 'paediatric flat foot'. These knowns include the authors previous work on establishing normative values for the FPI, other large population studies such as Pfeiffer 2006, Uden 2017 etc. and existing recommendations on when and why intervention may be beneficial (Rome et al, 2010, Evans pFFP, Harris, Dars systematic review (PloSOne 2018)) which makes statements such as those in Line 32 (clinicians make decisions based on their personal clinical experience) incorrect. The final paragraph of the introduction could also be a more critical review of the FPI, including more robust evaluations of its reliability and validity for use in paediatrics (Banwell et al. 2018).

We have include an new information to improve the background using these new references

The methodology also requires expansion and clarification. The dataset descriptions do not allow the reader an adequate understanding of the characteristics of the participants nor the recruitment process. Was the dataset only sourced from the authors previous work? Were other authors approached to supply data? What were the participants specifically recruited for? Was there any indication of the reliability of those measuring the data within the studies of recruitment? If it is the authors own dataset what is gained by this study (other than the amalgamation of data) that was not previously answered through the three separate studies conducted? If it is only the authors data, this needs to be strongly addressed as a limitation. BMI calculations appear to have been based on two separate measures and then re-classified. I would recommend attention to how this is explained within the text. There is no mention of gender of the sample prior to the results. Furthermore, the exclusion criteria does not specific 'inflammatory' disorders, which would presumably impact on the ability to evaluate the FPI.

We have tried to answer all your doubt of the method, we hope that you think that it is enough information to improve the quality of paper

Results: the results indicate that 33.7% of children were found to have 'flatfeet' based on a classification of equal or greater than +6 on the FPI. Yet there is nothing mentioned previously to base this on, and whilst correct, directly contravenes line 14 of the introduction where it states there is no agreed reference for classifying flat foot. Furthermore, why are the UK and Australian children analysed together in reference to differences in country. This needs to be explained in data management.

We have tried to include more information to clarify all your suggestion

Given the concerns observed to this point I have not reviewed the discussion section closely. It would be recommended on brief review that the authors need to clarify whether or not the reasons these outcomes concur with the previous studies is if they indeed included the same participants (Line 49 page 9 and line 4 page 10) and references are needed for live 6 page 10.

In relation with this point, we have included more participants and will be expected that will be similar results but in this cases the range has been increased it. About the references, I'm sorry, we don't understand, because this paragraph is re summary of our result

Other recommendations:

Would consider adding the words paediatric, Foot posture index, flat foot to the key words
They have been include them

Please identify the foot posture index as the 'six item' version at the first mention. This will reduce reader confusion from the original 'eight item' FPI.

Line 37 of methods – please correct 'talus-scaphoid' to 'talonavicular' accordingly.

It has been include it

In conclusion, this manuscript would benefit from further development and consideration of the participant characteristics prior to being accepted for publication.

VERSION 2 – REVIEW

REVIEWER	<p>Helen Banwell University of South Australia, Australia</p> <p>Angela M Evans was a previous colleague at University of South Australia. Dr Evans has not worked here for several years but we do have mutual colleagues and are often involved in the same conferences</p>
REVIEW RETURNED	28-Aug-2018

GENERAL COMMENTS	<p>Thank you for the opportunity to review this article again. I thank the authors for considering many of the previous suggestions. I reiterate that this work is of interest and timely. There are still a few minor concerns that needs addressing prior to being recommended for publication, however, I am confident these minor concerns can be addressed forthwith.</p> <p>The abstract requires attention. Whilst there is frequent confusion about paediatric foot posture, there is no evidence to suggest that there is universal 'over-diagnosis of flatfoot, or pronated foot, and unnecessary treatment'. Furthermore, the aim of this study was not to correct any 'over-diagnosis' etc. so the first section needs to be reworked. The abstract's conclusion or results also should speak to the trend of FPI-6 scores declining with age, emphasizing the non-significant/linear nature of the outcomes.</p> <p>The second minor concern is the introduction. Appreciation is given to the author's changes, however, paragraph 2 (line 16) requires further review in relation to citations. Uden et al. indicated in their systematic review that normative data of 8-year old or younger is a flat foot posture (not Banwell et al.) I would recommend restructuring the first two sentences along the lines of "In typically developing children, a flatter foot posture is expected under approximately 8 years of age [Uden et al reference] due to age appropriate osseous, ligament, adipose and neuromuscular structure and function [reference 8, 9, 10]. With variation,....." and removing the last sentence (Line 28) as the validity and reliability of the FPI-6 is discussed later in the introduction.</p> <p>The final sentence of the final paragraph of the introduction (line 19) needs minor rewording to either include et al. after Banwell, or change Banwell to 'a systematic review on the psychometric of foot posture measures....</p> <p>These concerns are minor and the authors should be congratulated for putting forth a large, robust population study on a difficult and controversial topic.</p>
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VERSION 2 – AUTHOR RESPONSE

The abstract requires attention. Whilst there is frequent confusion about paediatric foot posture, there is no evidence to suggest that there is universal ‘over-diagnosis of flatfoot, or pronated foot, and unnecessary treatment’.

Furthermore, the aim of this study was not to correct any ‘over-diagnosis’ etc. so the first section needs to be reworked. The abstract’s conclusion or results also should speak to the trend of FPI-6 scores declining with age, emphasizing the non-significant/linear nature of the outcomes.

This information has been change in the abstract “**Trend indicated a less ‘flat’ foot with age, although non-linear.**”

The second minor concern is the introduction. Appreciation is given to the author’s changes, however, paragraph 2 (line 16) requires further review in relation to citations. Uden et al. indicated in their systematic review that normative data of 8-year old or younger is a flat foot posture (not Banwell et al.) I would recommend restructuring the first two sentences along the lines of “In typically developing children, a flatter foot posture is expected under approximately 8 years of age [Uden et al reference] due to age appropriate osseous, ligament, adipose and neuromuscular structure and function [reference 8, 9, 10].

These sentences has been change **A** systematic review [8] **has addressed** flatfoot and clinical measures, in healthy children, **finding ‘flatfoot’ the expected foot posture before** eight years of age, due to young osseous structures, ligament laxity, increased adipose tissue, and immature neuromuscular control [9,10].

With variation,.....” and removing the last sentence (Line 28) as the validity and reliability of the FPI-6 is discussed later in the introduction.

This part of the sentences has been removed

The final sentence of the final paragraph of the introduction (line 19) needs minor rewording to either include et al. after Banwell, or change Banwell to ‘a systematic review on the psychometric of foot posture measures....

These concerns are minor and the authors should be congratulated for putting forth a large, robust population study on a difficult and controversial topic.

This part of the sentences has been modified Recently, the FPI **has been identified** as a preferred method of paediatric foot posture measurement in future research[29].

VERSION 3 – REVIEW

REVIEWER	Helen Banwell University of South Australia, Adelaide, Australia As stated in previous reviews of this manuscript, one of the authors worked with me 10 years ago (or more). I do not consider this to impact on my abilities to review this manuscript.
REVIEW RETURNED	06-Feb-2019

GENERAL COMMENTS	International normative data for paediatric foot posture assessment: a large-scale cross-sectional investigation. Thank you for forwarding the third submission of this article. While I thank the authors for considering and correcting many of the previously identified concerns, it is noted that there are still two main concerns, and several wording issues within the manuscript. I apologize for the bias in referencing that was not picked up in
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earlier reviews, and request the authors reconsider several statements below where they have introduced bias.

Main concerns:

The terminology used within the abstract remains concerning. The last review of this paper raised the following issue “Whilst there is frequent confusion about paediatric foot posture, there is no evidence to suggest that there is universal ‘over-diagnosis of flatfoot, or pronated foot, and unnecessary treatment’.

Furthermore, the aim of this study was not to correct any ‘over-diagnosis’ etc. so the first section (of the abstract) needs to be reworked.” The authors have either chosen not to respond to this or failed to note the suggestion. I would recommend that the abstract refrain from making such a strong and unjustifiable statement or remake in the intro and supply adequate references. My strong recommendation is the first option.

Secondly, there is no mention in the results of children that presented with a pes cavus foot type yet line 33 of the results section discuss “whole scores ranging from -4 to +12”. I understand the numbers presented in the abstract are mean values, but you need to include the range of findings as well, otherwise it suggests no children were found to be cavus? This was also queried in my original review of this manuscript.

Minor wording concerns:

It would also be recommended to reword the result section of the abstract:

Results: The foot posture of X children were reviewed. A pronated (FPI $\geq +6$) foot posture was found in 1087 (33.7%) children, a normal (FPI 0 to +6) foot posture in 1776 (55.2%), and a highly-pronated (FPI +10) foot posture was found in 127 children (3.9%), (range X to X FPI). Less than X% were found to have a pes cavus foot type (n = x). Approximately 20% of children were overweight/obese, but correlation between BMI and FPI was weak and inverse (r = -0.066, p < 0.01), refuting the relationship between increased body mass and flatfeet.

I would recommend the removal of the word ‘unnecessary’ in line 7 (first sentence) of the introduction. Also, need to add the words ‘or outside’ following the word ‘within’ on line 26 of the introduction (otherwise the sentence does not make sense).

Line 41 needs rewording ‘and Australian investigating....’ ? investigating what? Please add the study cohort here (e.g. flat foot, school aged children??). Also, please clarify why the numbers don’t match at the end of this sentence (301 subjects) (n = 303??)?

Bias observed:

Please also refrain from making the statement “these findings concur with the recent cross-sectional investigation of 1762 children.... [27]” (line 10 in the discussion section) as the same data was used in both studies – this needs to be cited as a source of bias here, not as a source of support. The same goes in line 40 of the discussion where the reference [40] again pertains to a data set used within this study. The authors need to be aware of the bias they are creating and reporting and alter the discussion accordingly.

VERSION 3 – AUTHOR RESPONSE

The terminology used within the abstract remains concerning. The last review of this paper raised the following issue “Whilst there is frequent confusion about paediatric foot posture, there is no evidence to suggest that there is universal ‘over-diagnosis of flatfoot, or pronated foot, and unnecessary treatment’.

Furthermore, the aim of this study was not to correct any ‘over-diagnosis’ etc. so the first section (of the abstract) needs to be reworked.” The authors have either chosen not to respond to this or failed to note the suggestion. I would recommend that the abstract refrain from making such a strong and unjustifiable statement or remake in the intro and supply adequate references. My strong recommendation is the first option.

This information has been change in the abstract “The Foot Posture Index (FPI) is an observational tool designed to measure the position of the foot.”

Secondly, there is no mention in the results of children that presented with a pes cavus foot type yet line 33 of the results section discuss “whole scores ranging from -4 to +12”. I understand the numbers presented in the abstract are mean values, but you need to include the range of findings as well, otherwise it suggests no children were found to be cavus? This was also queried in my original review of this manuscript.

We have included the data of supinated foot type(it is the term use in the concept of FPI) in the result section “and supinated foot were found in 354 (11%)”

It would also be recommended to reword the result section of the abstract:

Results: The foot posture of X children were reviewed. A pronated (FPI $\geq +6$) foot posture was found in 1087 (33.7%) children, a normal (FPI 0 to +6) foot posture in 1776 (55.2%), and a highly-pronated (FPI +10) foot posture was found in 127 children (3.9%), (range X to X FPI). Less than X% were found to have a pes cavus foot type (n = x). Approximately 20% of children were overweight/obese, but correlation between BMI and FPI was weak and inverse (r = -0.066, p< 0.01), refuting the relationship between increased body mass and flatfeet. .

These sentences has been change and we have used your text suggestion, we have used supinated foot because the FPI uses this term, not cavus : “The foot posture of 3217 children were reviewed. A pronated (FPI $\geq +6$) foot posture was found in 960 (29.8%) children, a normal (FPI 0 to +6) foot posture in 1776 (55.2%), and a highly-pronated (FPI +10) foot posture was found in 127 children (3.9%), (range -4 to +12 FPI). Less than 11% were found to have a supinated foot type (n = 354). Approximately 20% of children were overweight/obese, but correlation between BMI and FPI was weak and inverse (r = -0.066, p< 0.01), refuting the relationship between increased body mass and flatfeet.”

I would recommend the removal of the word ‘unnecessary’ in line 7 (first sentence) of the introduction. Also, need to add the words ‘or outside’ following the word ‘within’ on line 26 of the introduction (otherwise the sentence does not make sense).

We have removed ‘unnecessary’ in line 7 and we have included or outside’ in line 26

Line 41 needs rewording ‘and Australian investigating....’ ? investigating what? Please add the study cohort here (e.g. flat foot, school aged children??). Also, please clarify why the numbers don’t match at the end of this sentence (301 subjects) (n = 303??)?

I'm sorry, it was a mistake, we have deleted the error 301 subjects and we have included "Australia investigating foot posture in young children with Sever's disease "

Please also refrain from making the statement "these findings concur with the recent cross-sectional investigation of 1762 children.... [27]" (line 10 in the discussion section) as the same data was used in both studies – this needs to be cited as a source of bias here, not as a source of support. The same goes in line 40 of the discussion where the reference [40] again pertains to a data set used within this study. The authors need to be aware of the bias they are creating and reporting and alter the discussion accordingly.

We have refrain both senteces and we have deleted the this part "These findings concur with the recent cross-sectional investigation of 1762 children aged six to 11 years [27]. Similarly to Gijon-Nogueron et al [27]" and Our results contrasted with many older studies which asserted that heavier, fatter children have flatter feet. Importantly, the previous studies all assessed foot posture using a footprint based method of foot posture assessment [5,40,41]

VERSION 4 – REVIEW

REVIEWER	Helen Banwell University of South Australia, Adelaide, South Australia, Australia previously stated
REVIEW RETURNED	25-Feb-2019
GENERAL COMMENTS	The authors are commended for taking on the feedback. I hope they agree that the final document is more robust and improved for the efforts.