

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Longitudinal associations of gross motor development, motor milestone achievement, and weight-for-length z-score in a racially diverse cohort of US infants
AUTHORS	Shoaibi, Azza; Neelon, Brian; Ostbye, Truls; Benjamin-Neelon, Sara E.

VERSION 1 – REVIEW

REVIEWER	Danae Dinkel University of Nebraska at Omaha, USA
REVIEW RETURNED	17-Jun-2018

GENERAL COMMENTS	<ul style="list-style-type: none"> • Page 2, line 49 – suggest deleting the word “among” • Page 3, lines 10-12 – suggest adding something that this is true primarily for males. • Page 5, line 49 – what do you mean by non-biologically plausible, potential error in recording/assessment? Or as you mention below, were these outside of WHO windows for achievement. • Page 6, lines 35-37 – would suggest changing the sentence to past tense, “the fine motor score is comprised of 66 items...” and make a similar change below with gross motor score description • Page 7, line 19 – in the rest of the paragraph you use the number and here you spell out four limbs, please change for consistency • Page, 7, lines 19-24 – would suggest the following : Consistent with our previous study, we categorized age of achievement into 3 groups... • Page 7, lines 36-40 - you mention you took length/weight in triplicate, did you use the average? • Page 7, line 52 – insert “and” before “race” • Page 12, line 10 – please correct the authors name. • Page 12, lines 49-51 – what age group was the systematic review for? • Page 12, lines 45-50 – if room I would suggest adding a couple of sentences regarding research on how mothers and fathers may treat their child differently even in in this infant stage. • For discussion – how do your demographics compare with national averages on breastfeeding in this group, any research looking at breastfeeding and motor development or do you think this is worth further research? Any differences in breastfeeding of males vs. females? • In the results you mentioned an increasing trend for weight-for-length z-scores indicating they got relatively heavier – was there a sub-group of outliers they may have influenced this or was this a general trend of all infants?
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REVIEWER	Ana Cristina Resende Camargos
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	Universidade Federal de Minas Gerais - Brazil.
REVIEW RETURNED	19-Jun-2018

GENERAL COMMENTS	<p>The paper is well written, the study is well conducted and the results are well described. The manuscript investigated the longitudinal associations between gross motor development and obesity. However, only weight-for-length z-scores were used. The authors used the term “obesity” in the study but did not identify cut-off points to differentiate obese, overweight, at-risk overweight, normal, underweight and severely underweight infants. The authors conclude that higher motor development score and earlier crawling were associated with lower subsequent weight-for-length z-score. Moreover, male infants appeared to influence these associations.</p> <p>In this way, I make the following observations:</p> <p>TITLE The authors uses the word “obesity” in the title of the manuscript “Gross motor development, motor milestone achievement, and obesity in a racially diverse cohort of US infants”. However, only weight-for-length z-scores were used and cut-off points were not described to identify overweight and obese children. Then, I suggest modify the title for “Gross motor development, motor milestone achievement, and weight-for-length z-scores in a racially diverse cohort of US infants”.</p> <p>ABSTRACT Page 2, line 6: I suggest modify the term “obesity” for “weight-for-length”. Page 2, line 8: I suggest modify the sentence “In a secondary aim, we explored potential bidirectional relationships, as early obesity may impede motor development and poor motor development may lead to obesity.” for “In a secondary aim, we explored potential bidirectional relationships, as early higher weight-for-length may impede motor development and poor motor development may lead to higher weight-for-length.”</p> <p>STRENGTHS AND LIMITATIONS Page 3, line 19: I suggest modify the sentence “This study includes multiple prospective measures of motor development and obesity,...” for ““This study includes multiple prospective measures of motor development and weight-for-length z-scores,...”</p> <p>BACKGROUND Page 4, line 38: I suggest modify the sentence “Other studies suggest that physical activity and gross motor movement may provide opportunities...” for Other studies suggest that physical activity and gross motor skills may provide opportunities...”.</p> <p>METHODS Page 7, line 8: In the sentence “However, we also examined gross motor development score only, as we were most interested in motor development as a marker of physical activity.” What score was used? Raw score or scaled score? Page 7, line 38: I think it is also importante characterize the sample describing weight-for-length cut-off points to differentiate</p>
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	<p>obese, overweight, at-risk overweight, normal, underweight and severely underweight infants.</p> <p>RESULTS TABLE 1: I suggest characterize the sample according to weight-for-length cut-off points. Insert number (percent) of infant with obesity, overweight, at-risk overweight, normal, underweight and severely underweight infants.</p> <p>CONCLUSIONS Page 14, line 31: I suggest modify the sentence “Our study contributes to the growing body of evidence suggesting that delayed motor development may be associated with later obesity” for “Our study contributes to the growing body of evidence suggesting that delayed motor development may be associated with higher weight-for-length in the future”.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1:

1. Page 2, line 49 – suggest deleting the word “among”

Thank you for this suggestion. The word “among” has been deleted.

2. Page 3, lines 10-12 – suggest adding something that this is true primarily for males.

Thank you for this suggestion. Page 3, lines 3-5 now read, “Higher motor development score and earlier crawling were associated with lower subsequent weight-for-length z-score. However, this is primary true for male infants only”

3. Page 5, line 49 – what do you mean by non-biologically plausible, potential error in recording/assessment? Or as you mention below, were these outside of WHO windows for achievement.

The 8 values were outside the range of the WHO windows for motor milestone achievement. For clarity, Page 5, lines 45-50 now read “We further excluded those with missing information on covariates included in all models *a priori* and those with missing motor development scores or values outside the World Health Organization (WHO) windows for motor milestone of achievement (n=8), leaving a total analysis sample of 425 infants.”

4. Page 6, lines 35-37 – would suggest changing the sentence to past tense, “the fine motor score is comprised of 66 items...” and make a similar change below with gross motor score description

Thank you for noting the grammatical error – we have made this change.

5. Page 7, line 19 – in the rest of the paragraph you use the number and here you spell out four limbs, please change for consistency

Thank you, we now consistently use numbers.

6. Page 7, lines 19-24 – would suggest the following: Consistent with our previous study, we categorized age of achievement into 3 groups...

We made the suggested changes. Page 7, lines 22-26 now read: “Consistent with our previous study [24] and based on the WHO windows for motor milestone achievement,[15] we categorized age of achievement into 3 groups.”

7. Page 7, lines 36-40 - you mention you took length/weight in triplicate, did you use the average?

Yes, the statement has been revised for clarity. Page 7, lines 38-45 now read “Trained data collectors measured infant weight and length at each home visit—recumbent length to the nearest 1/8th inch and weight to the nearest 0.1 pound in triplicate. We then used the average of the three measures.”.

8. Page 7, line 52 – insert “and” before “race”

Thank you. The suggested change has been made.

9. Page 12, line 10 – please correct the authors name.

Thank you, the name is now corrected.

10. Page 12, lines 49-51 – what age group was the systematic review for?

We have now added the age group (4 to 6 years) to the text. Page 13, lines 15-18 now read “A recent systematic review in children ages 4 to 6 years notes a positive relation between physical activity and motor milestone achievement, which could help explain the association”

11. Page 12, lines 45-50 – if room I would suggest adding a couple of sentences regarding research on how mothers and fathers may treat their child differently even in in this infant stage.

We now include additional text on how parents' treatment and interactions may be related to the physical activity and motor development. Page 13, line 19-33 read “Parental support of physical activity may also play a role in motor development differences between boys and girls. In a longitudinal study among 12-year-old children [32], girls reported less parental support of physical activity when compared to boys. Findings from the same study suggested that higher levels of parental support were translated to higher levels of physical activity in boys but not girls. These differences may be evident even earlier in childhood, although evidence is lacking.

12. For discussion – how do your demographics compare with national averages on breastfeeding in this group, any research looking at breastfeeding and motor development or do you think this is worth further research? Any differences in breastfeeding of males vs. females?

We added the following to our discussion:

Thank you for noting the important role of breastfeeding. We have added a few sentences to discuss breastfeeding. Page 14, line 3-17 read “Breastfeeding may also influence the relationship between obesity and motor development in infancy. Some evidence suggests improved motor development in breastfeed infants and toddlers [35], but findings have not been consistent across multiple studies. [36] In our study, 28.51% of infants were breastfed at 6 months of age, which is lower than the national prevalence of 57.6%. [37] Further research is needed to investigate the exact role of breastfeeding on the relationship between early obesity and motor development. In our study, we controlled for breastfeeding in the final model.”

13. In the results you mentioned an increasing trend for weight-for-length z-scores indicating they got relatively heavier – was there a sub-group of outliers they may have influenced this or was this a general trend of all infants?

To address this comment, we computed the scaled residuals for the final model. There was no evidence of outlying observations when we examined the scaled residuals from the final model. We now clarify this issue in the results section. Page 10, line 17-27 Line read “Figure 1 (b) shows an increasing trend for weight-for-length z-scores, indicating that infants got relatively heavier throughout the assessment period. In this sample, the mean weight-for-length z-score was 0.14 (1.03) at birth

and increased to 0.64 (1.01) at 12 months. There was no evidence of outlying observations when we examined the scaled residuals from the final model.[27] ”

Reviewer 2:

1. TITLE: The authors use the word “obesity” in the title of the manuscript “Gross motor development, motor milestone achievement, and obesity in a racially diverse cohort of US infants”. However, only weight-for-length z-scores were used and cut-off points were not described to identify overweight and obese children. Then, I suggest modify the title for “Gross motor development, motor milestone achievement, and weight-for-length z-scores in a racially diverse cohort of US infants”.

Thank you for this important note. The new manuscript title is: Longitudinal associations of gross motor development, motor milestone achievement, and weight-for-length z-score in a racially diverse cohort of US infants

2. ABSTRACT: Page 2, line 6: I suggest modify the term “obesity” for “weight-for-length”.

The suggested change has been made.

3. Page 2, line 8: I suggest modify the sentence “In a secondary aim, we explored potential bidirectional relationships, as early obesity may impede motor development and poor motor development may lead to obesity.” for “In a secondary aim, we explored potential bidirectional relationships, as early higher weight-for-length may impede motor development and poor motor development may lead to higher weight-for-length.”

Thank you. The suggested change has been made.

4. STRENGTHS AND LIMITATIONS

Page 3, line 19: I suggest modify the sentence “This study includes multiple prospective measures of motor development and obesity,.” for ““This study includes multiple prospective measures of motor development and weight-for-length z-scores””:

Thank you. The suggested change has been made.

5. BACKGROUND: Page 4, line 38: I suggest modify the sentence “Other studies suggest that physical activity and gross motor movement may provide opportunities...” for Other studies suggest that physical activity and gross motor skills may provide opportunities...”.

Thank you. The suggested change has been made.

6. METHODS: Page 7, line 8: In the sentence “However, we also examined gross motor development score only, as we were most interested in motor development as a marker of physical activity.” What score was used? Raw score or scaled score

The Page 7, line 10 has been modified to clarify that we used the scaled score. It now reads “However, we also examined the scaled gross motor development score only, as we were most interested in motor development as a marker of physical activity.”

7. Page 7, line 38: I think it is also important characterize the sample describing weight-for-length cut-off points to differentiate obese, overweight, at-risk overweight, normal, underweight and severely underweight infants.

Thank you. The suggested data has been added to Table 1.

8. RESULTS TABLE 1: I suggest characterize the sample according to weight-for-length cut-off points. Insert number (percent) of infant with obesity, overweight, at-risk overweight, normal, underweight and severely underweight infants.

Thank you, the suggested data has been added to table one and described in the results. Page 9, lines 52-55 read as follow “At 12 months, 66.5% of infants were normal and over one third were considered at risk of overweight, overweight, or obese.”

9. CONCLUSIONS Page 14, line 31: I suggest modify the sentence “Our study contributes to the growing body of evidence suggesting that delayed motor development may be associated with later obesity” for “Our study contributes to the growing body of evidence suggesting that delayed motor development may be associated with higher weight-for-length in the future”

Thank you, the suggested change has been made.

VERSION 2 – REVIEW

REVIEWER	Danae Dinkel University of Nebraska at Omaha
REVIEW RETURNED	26-Sep-2018

GENERAL COMMENTS	I have only a few minor comments below: 1) Pg. 6 line 49 add ":Third Edition" after Bayley's 2) Pg. 11 line 45 add "with" before weight-for-length z-score Pg. 14, line 5 change to "..in breastfed infants.." Otherwise, looks great, nice paper.
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REVIEWER	Ana Camargos UFMG, Brazil
REVIEW RETURNED	25-Sep-2018

GENERAL COMMENTS	All suggested adaptations have been made and therefore I consider the manuscript suitable for publication.
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