Academic Editorial: Maternal correlates of cardiovascular risk in Hispanic children

Editorial provided by Gwendolyn A. Quintana, MPH, MS1 on June 1, 2018. Contact information: gwendolyn.a.quintana@gmail.com

1. Basic Reporting

OBJECTIVE	COMMENT
Clear and unambiguous, professional English used throughout.	English is clear and unambiguous and professional. Authors are urged to refrain from using multiple terms to describe one topic throughout (i.e. cardiovascular risk). See comments below.
The article must be written in English and must use clear, unambiguous, technically correct text. The article must conform to professional standards of courtesy and expression.	English is used properly. Authors are urged to used concise statements throughout to improve reader understanding.
Literature references, sufficient field background/context provided.	Literary references are sufficient but not optimal. See commentary within each recommendation.
The article should include sufficient introduction and background to demonstrate how the work fits into the broader field of knowledge. Relevant prior literature should be appropriately referenced.	Sufficient introduction and background are provided. Authors are reminded that these sections should stay highly focused on the topic of interest and should not sway from the specific objective.
Professional article structure, figs, tables. Raw data shared.	Figures are appropriate and legible. Recommendations regarding study model are made below. Primary raw data was not provided.
The structure of the article should conform to an acceptable format of 'standard sections' (see our Instructions for Authors for our suggested format). Significant departures in structure should be made only if they significantly improve clarity or conform to a discipline-specific custom.	Standard sections are appropriate. The authors are urged to consider including a concise 'conclusion' to the abstract.
Figures should be relevant to the content of the article, of sufficient resolution, and appropriately described and labeled.	Figures are appropriate.
All appropriate raw data has been made available in accordance with our Data Sharing policy.	Raw data was not provided; authors provide appropriate explanation as to why.
Self-contained with relevant results to hypotheses.	Hypotheses are clearly stated but may need improved fluidity. See comments below.

The submission should be 'self-contained,' should represent an appropriate 'unit of publication' and should include all results relevant to the hypothesis.	The manuscript fulfills this requirement. Comments regarding hypothesis representation are made below.
Coherent bodies of work should not be inappropriately subdivided merely to increase publication count.	Although it is no required to remove, it is evident there are some unnecessary subdivisions (i.e. perceptions data).

The following statements are agreeable to the reviewer and should not be removed from the manuscript if possible:

Agreeable: Authors use appropriate source for recommended child screen time.

American Academy of Pediatrics is an excellent and appropriate source choice for establishing the recommended screen time for children. Authors appropriately describe how data falls into categorization based off these recommendations. See lines 147- 151.

Agreeable: Authors clearly define hypothesis to prepare readers for analysis.

Authors provide an excellent tool for communicating the purpose of the article. Further, the hypotheses are appropriately placed within the articles. Although hypothesis should not be changed after commencement or completion of the research, authors are encouraged to read statements on track changes document for suggestions on further study hypothesis. See lines 82-89.

The following are recommendations listed from most recommended to less recommended:

Recommendation: Change the title to reflect the findings. It is important to keep terms "Hispanic children" but "cardiometabolic risks" should be replaced.

The manuscript title should reflect the data findings and appropriate context. Consider replacing "cardiometabolic risks" with "healthy lifestyles" or "physical activity, blood pressure, and body mass index". Cardiometabolic risks are not fully represented in this article. See the clinical application, diagnosis, and definitions for cardiometabolic risks. You may consider using the term "atherosclerotic risks". The concern here is that the conclusions may be considered invalid if the cardiovascular risks and/or atherosclerotic risks have not been fully and properly being assessed. BMI may be used as a screening tool but cannot be used alone to classify a child for cardiometabolic risk entirely. Suggested titles include:

- *The influence of maternal BMI on physical activity of preadolescent Hispanic children*
- *Hindrances to physical activity in Hispanic children*
- *The relationship between maternal BMI and healthy lifestyles in preadolescent Hispanic children*

Nichols GA, Horberg M, Koebnick C, Young DR, Waitzfelder B, Sherwood NE, et al. Cardiometabolic Risk Factors Among 1.3 Million Adults With Overweight or Obesity, but Not Diabetes, in 10 Geographically Diverse Regions of the United States, 2012–2013. Prev Chronic Dis 2017;14:160438. DOI: http://dx.doi.org/10.5888/pcd14.160438

US Endocrinology, 2007;(1):60-3 DOI: http://doi.org/10.17925/USE.2007.00.1.60

Wilson PW, Meigs JB. Cardiometabolic risk: a Framingham perspective. Int J Obes (Lond). 2008 May;32 Suppl 2:S17-20. doi: 10.1038/ijo.2008.30. Review. PubMed PMID: 18469835.

Kelly, A.S., S.E. Barlow, G. Rao,et al. 2013. Severe obesity inchildren and adolescents: identification, associated healthrisks, and treatment approaches: a scientific statement from the American Heart Association. Circulation 128: 1689–1712.

Flegal, K.M., R.Wei, C.L. Ogden,et al. 2009. Characterizing extreme values of body mass index-for-age by using the 2000 Centers for Disease Control and Prevention growth charts. Am. J. Clin. Nutr. 90: 1314–1320.

Recommendation: Terms 'cardiovascular', 'cardiometabolic', 'obesogenic' [, 'metabolic syndrome', and 'atherosclerotic'] should not be used interchangeably.

The authors should pick a term and hone in on it. Try to refrain from introducing new terms into the article unless they are essential to the article. See title, lines 1, 24, 27, 53, table 1, 2.

Similarly, authors should be wary of terms 'overweight', 'obese', 'severely obese', and 'BMI'. Consider using clinical vernacular to define these terms at the beginning of the article and choose one or two variables to assess throughout the course of the manuscript.

Another example of this is words 'height' and 'weight' being used concurrently with BMI. Define the variable and choose one. That is, if authors decide to study BMI relationships, define how BMI is calculated and discuss BMI. Discussions and statements regarding 'height' and 'weight' are hence redundant and should not be included unless defining another variable of the study.

https://www.cdc.gov/obesity/adult/defining.html

Recommendation: Replace 'children' and 'young children' with 'preadolescent'.

The authors target a very intriguing child age range. Authors should state specifically what range that is within the abstract and introduction. Nevertheless, age ranges of child subjects are disclosed analyzed appropriately.

Recommendation: Consider including best practices for the subject matter from credible sources in the introductory area of the article.

Best practices are essential for providing the reader with the appropriate knowledge and context. Authors may also consider the prevention strategies recommended by the Center for Disease Control and Prevention (https://www.cdc.gov/obesity/resources/strategies-guidelines.html). CDC statements on obesity are included but strategies, guidelines, and recommendations are not.

American Heart Association. (2013). Healthy Way to Grow. Retrieved from http://www.healthywaytogrow.org/HWTG/ *and* https://www.heart.org/idc/groups/heart-public/@wcm/@adv/documents/downloadable/ucm_473791.pdf

Kumanyika, S.K., et al. (2008). Population-based prevention of obesity: The need for comprehensive promotion of healthful eating, physical activity, and energy balance. Circulation, 118(4), 428-464. doi: 10.1161/circulationaha.108.189702.

Pate, R.R., Davis, M.G., Robinson, T.N., Stone, E.J., McKenzie, T.L., & Young, J.C. (2006). Promoting physical activity in children and youth a leadership role for schools: A scientific statement from the American Heart Association Council on Nutrition, Physical Activity, and Metabolism (Physical Activity Committee) in collaboration with the councils on Cardiovascular Disease in the Young and Cardiovascular Nursing. Circulation, 114(11), 1214- 1224

Recommendation: State the increase of obesity prevalence among Hispanics and/or entire US population.

Authors should consider presenting the relevance to this problem by providing a numerical value of increased incidence and prevalence over the past 10-20 years. Authors mention prevalence values, but this does not represent the increased incidence over a long period of time. Although not necessary, authors may consider providing values specific for Tennessee, US, non-Hispanic, Hispanic, age-specific onset and others.

Recommendation: 'Discussion' portion of the abstract should be edited.

Please see track changes document submitted. The discussion portion should either reflect a broad overview of the findings and a concise conclusion or only a broad overview of the findings. If the latter, authors should consider including a 'Conclusion' subsection to the abstract containing 40 letters or less.

Recommendations: Delineate from whom 'negative perceptions' are being assessed early in the manuscript.

Delineating this terminology is important for readers to understand early on. If not described early, the reader may remain uncertain whether the authors are discussing negative perceptions of community stakeholders, of the child subjects, of the mothers, of the parents, and so forth. Noteworthy, the assessment of community perceptions is complex and difficult to interpret. A recommendation to omit several, if not, all variables regarding maternal negative perceptions is expressed. See considerations below. The article is not suitable for submission to a survey research journal nor journals with a high degree of reliance on survey research methods.

The following are comments on considerations for the authors. No action necessary unless otherwise decided by authors:

Consideration: Include a 'Purpose' subsection within the abstract to state the scope of the article in 1 or 2 sentences.

The background and methods section may be perceived as discombobulated. There are several variables being discussed, some of which are not represented in the data. Consider making a short and concise statements such as "*This study will analyze if maternal BMI, PA, and perceptions pose risks for adolescent BMI, PA, and BP in a Hispanic subject set*". Although this is described in depth in the abstract and other areas, it may be difficult for the reader to understand what the author's goals are after reading the abstract. See track changes document lines 78-81 to see how purpose may be reworded in a clear and concise manner.

Consideration: Include a statement on inheritability, or absence thereto, of atherosclerotic disease and obesity.

Because the authors are claiming that there is existing research on obesogenic factors and their correlation to the health of older children, it may be appropriate to state whether genetics may play a role. If the influence of environment plays a greater role, authors should state so and why.

Consideration: Avoid the use of double negative and double/triple "less-more-than-most-at least" terminology.

Although such terminology must be used for statistical analysis and study structure sometimes, authors should strive to avoid it, if possible. Extensive use of double negative variables, analysis, and phrases lend to decreased clarity. Although this is not means for omission, nor is it incorrect, authors should be wary of such writing techniques. See lines 40-44, 216, 219-226, 227-233, 234-236.

Consideration: Stay mindful of citation style and requirements of the choice journal.

2. Experimental Design

OBJECTIVE	COMMENT
Original primary research within Aims and Scope of the journal.	Not applicable. Aims and scope not shared.
Research question well defined, relevant & meaningful. It is stated how research fills an identified knowledge gap.	Sufficient.
The submission should clearly define the research question, which must be relevant and meaningful.	Sufficient.
The knowledge gap being investigated should be identified, and statements should be made as to how the study contributes to filling that gap.	Sufficient.
Rigorous investigation performed to a high technical & ethical standard.	Sufficient but needs improvement.
The investigation must have been conducted rigorously and to a high technical standard. The research must have been conducted in conformity with the prevailing ethical standards in the field.	Sufficient.
Methods described with sufficient detail & information to replicate.	Excellent. Consider condensing information in this section. Authors do an excellent work in describing the methods, especially inclusion and exclusion criteria.
Methods should be described with sufficient information to be reproducible by another investigator.	Sufficient.

The following statements are agreeable to the reviewer and should not be removed from the manuscript if possible:

Agreeable: Inclusion of age-based pediatric growth reference charts are an excellent tool used by the investigators.

The authors use the appropriate CDC Aged-based Pediatric Growth Reference Charts to characterize their subjects. This tool provides a quantitative value that can be used in a myriad of statistical analysis.

Agreeable: Raw data receives appropriate adjustments.

Authors report appropriate adjustments to raw data set characterizations such as maternal education and child age and gender.

Agreeable: Maternal blood pressure is not included in analysis.

Because maternal BP may be highly variable due to pharmacological use, pregnancy, or other, it's understandable that they authors did not include this highly fluctuating variable as part of their analysis.

Agreeable: Statistical methods utilizes are acceptable.

The use of chi-squared, Fisher's exact tests, for sociodemographic characterization of the data set and bivariate analysis is appropriate for this study. Noteworthy, authors should consider how categorization of quantitative variable values are represented in this statistical analysis.

Agreeable: Authors exclude patients with existing serious physical or mental illness.

Because authors state they've excluded patients with serious and mental illness, the reader can understand that subjects used for this study are less likely to have confounding biases and the like.

The following are recommendations listed from most recommended to less recommended:

Recommendation: Inclusion criteria should specify maternal ethnicity.

Whether or not all mothers identified as Hispanic, it is important to specify such to the reader. If subject dyads include non-Hispanic mothers to Hispanic preadolescents this renders a different conclusion than if subject dyads include *only* Hispanic mothers to Hispanic preadolescents. That is, it should be stated if there is a possible paternal factor involved. If the latter is how the data qualifies, consider using 'Hispanic households' to identify the parental subjects instead of 'maternal' or 'mother'. If such is the case, households should be screened for single-parent households.

Recommendation: State the existing research.

Maternal obesity and lifestyles have been researched regarding their effects on infant and child atherosclerotic risk. Positive family history, and the presence of dyslipidemia in parents, children or adolescents has been previously investigated. One such example is given below. Although the article aims to discuss other items, it is important to inform the reader that maternal atherosclerotic factors have been associated with childhood atherosclerotic risk. If the authors decide to omit terminology such as 'cardiometabolic' and the like, this recommendation may be dismissed.

Napoli C, Glass CK, Witztum JL, Deutsch R, D'Armiento FP, Palinski W. Influence of maternal hypercholesterolaemia during pregnancy on progression of early atherosclerotic lesions in childhood: Fate of Early Lesions in Children (FELIC) Study. Lancet 354, 1234-1241 (1999).

Recommendation: Omit neighborhood ratings variable.

The authors do not report any perceptions below 'somewhat good/average' satisfaction and, therefore, should not be used to contribute to hypothesis number one. That is, if there are no subjects that report a negative perception, the data cannot be used to test for a correlation to child physical activity, BP, and BMI. See Table 2. Because the authors state in their first sentence that "negative perceptions of neighborhoods have been identified as obesogenic", the authors should revisit those findings to create questionnaire that are in alignment with what is considered "negative perceptions". Similar dilemmas - may be found in maternal BMI, see lines 175-177.

Recommendation: Condense confidentiality and informed consent statements.

Consider condensing this statement found in lines 109-115 to, for example, "Mother-child dyads were provided written and oral information on the study protocols and purpose and thereto were requested

to provide written voluntary informed consent; all of which consented. Children seven years or older and mothers were required to provide written informed consent to proceed with the study."

The following are comments on considerations for the authors. No action necessary unless otherwise decided by authors:

Consideration: If possible, include odds ratio values in the Table 3. Bivariate associations between children's physical activity, TV viewing, blood pressure, and BMI.

Consideration: The authors may find it relevant to state that multiple logistic regression models were used specifically to calculate respective odds ratios.

Consideration: Authors may consider removing perceptions as a variable.

First, the perceptions measured are numerous; this quantity may supersede the necessary measures for communicating the intended analysis. It may cause confusion to the reader as to what the core variables studied are. Secondly, the significance, or insignificance, of maternal perceptions of their community are not stated within the conclusions. Because this was presented as a pinnacle of the study in the abstract and introductory statements, authors should consider including a concluding statement or removing the variable. Third, the questionnaires, although acceptable, are not structured to the maximum benefit to the study. Because the study has been completed, data cannot be modified but authors should be wary of how the survey methodology may result in unintended data results that do not reflect the purpose of the article. Lastly, there are three questionnaire variables that pertain to neighborhood perceptions. Authors can consider omitting all three, condensing these three, or omitting two of the three. This would allow the reader to assess Table 2 much more fluently. It is unclear why three perception variables are included

Consideration: TV screen time should be discussed further.

TV screen time is a progressively growing measure within the field of public health because of the increased use of screens in today's children. This shows that the authors have a good understanding of the issue at hand. Although, data and the importance of TV screen time presented to the reader is only lightly discussed. Consider replacing 'TV screen time' to 'screen time' since authors used TV and video as a measure of screen time.

3. Validity of findings

OBJECTIVE	**COMMENT**
Impact and novelty not assessed. Negative/inconclusive results accepted. Meaningful replication encouraged where rationale & benefit to literature is clearly stated.	Impact is stated clearly. Authors are urged to discuss why non-Hispanic groups were not used further and how future longitudinal studies including non-Hispanic groups would be beneficial.
Decisions are not made based on any subjective determination of impact, degree of advance, novelty, being of interest to only a niche audience, etc. Replication experiments are encouraged (provided the rationale for the replication, and how it adds value to the literature, is clearly described); however, we do not allow the 'pointless' repetition of well known, widely accepted results.	Sufficient.
The data on which the conclusions are based must be provided or made available in an acceptable discipline-specific repository. The data should be robust, statistically sound, and controlled.	Data not available to reader, authors provide appropriate explanation why and willingness to share upon specific request.
Conclusion are well stated, linked to original research question & limited to supporting results.	Conclusion needs modification to reflect pinnacle results of the data and hypothesis findings.
The conclusions should be appropriately stated, should be connected to the original question investigated, and should be limited to those supported by the results.	Conclusion is clearly stated but needs improvement. See comments below.

The following are recommendations listed from most recommended to less recommended:

Recommendation: Authors should state the purpose behind using categorical statistical analysis for quantitative values, such as BMI.

The readers should be well informed on why BMI ranges were used for statistical analysis instead of numerical BMI values. This could potentially be affecting statistical outcomes especially since four categories were grouped into two for analysis. See lines 136-138. Similar categorization is found for adolescent age groups one and two. See lines 184-186.

Recommendation: Authors should state how longitudinal studies remain necessary for further investigating the correlation between mentioned maternal factors and mentioned preadolescent factors.

The association between various maternal atherosclerotic predisposing factors, such as physical activity, and child body weight, particularly obesity, has been investigated. Although, sufficient longitudinal

studies have yet to be published. This and other similar future studies should be mentioned in attempt to clarify the remaining gap of knowledge.

Recommendation: Briefly discuss the lack of multicultural analysis for this topic and how it would further contribute to the issue.

Recommendation: Future studies with different statistical analysis and inclusion of control groups.

It is important for the authors to recognize that, although thorough, the data cannot make assumptions regarding inclined risk of any of the mentioned variables in Hispanic children, as compared to their White non-Hispanic peers. Although past studies have established several of these correlations, this article does not provide sufficient controls to make such conclusions.

The following are comments on considerations for the authors. No action necessary unless otherwise decided by authors:

Consideration: Clarify whether the 118 subjects had or had not metabolic syndrome.

It appears the data that was used for this manuscript as extracted from a previous study. This is a useful method for clinical research, namely because existing data set may be difficult to obtain in select communities. Having said this, it is unclear whether the data set that was used in this study was extrapolated from an existing set of subjects for whom which all had metabolic syndrome. If so, it is important to state that subjects that reported pre-existing or diagnosed metabolic syndrome were included in this study and that no non-metabolic syndrome subjects were used in this study.

Consideration: Explain that this article is only representative of Hispanic adolescent physical activity over the past 7 days and TV screen time over the past 30 days.

Although the authors state that this is a cross-sectional data set, the reader only learns that the questionnaire data only represents maternal perceptions of 7-day and 30-day periods. For future studies, authors should consider including “on average” with relevant questions and refrain from ‘within the past X days’ to improve sampling.

4. Other comments

Authors clearly state the lack of any conflicts of interests. Similarly, I, Gwendolyn A. Quintana, do not have any conflicts of interests to report.

Although not directly representative of this study here are some articles that may be of use for the authors for assessing the application of their study to the broader topics mentioned.

Cui, Z; Truesdale, K P; Bradshaw, P T; Cai, J; Stevens, J. *International Journal of Obesity*; London Vol. 39, Iss. 8, (Aug 2015): 1203-1208. DOI:10.1038/ijo.2015.56

Oliveira, F. L. C., Patin, R. V., & Escrivão, M. A.,Meil Schimith. (2010). *Atherosclerosis prevention and treatment in children and adolescents. Expert Review of Cardiovascular Therapy*, 8(4), 513-28. doi:http://dx.doi.org/10.1586/erc.09.170

I would like to thank the authors for their contributions to maternal and adolescent public health through the work done in this manuscript and more to come. Please do not hesitate to request additional information or clarification regarding the review of this manuscript.

Maternal correlates of cardiovascular risk in Hispanic children (#25834)

First submission

Editor guidance

Please submit by **8 Jun 2018** for the benefit of the authors (and your $200 publishing discount).

Structure and Criteria
Please read the 'Structure and Criteria' page for general guidance.

Custom checks
Make sure you include the custom checks shown below, in your review.

Author notes
Have you read the author notes on the guidance page?

Raw data check
Review the raw data. Download from the materials page.

Image check
Check that figures and images have not been inappropriately manipulated.

Privacy reminder: If uploading an annotated PDF, remove identifiable information to remain anonymous.

Files
Download and review all files from the materials page.

4 Table file(s)

Custom checks

Human participant/human tissue checks

- Have you checked the authors ethical approval statement?
- Does the study meet our article requirements?
- Has identifiable info been removed from all files?
- Were the experiments necessary and ethical?

Structure and Criteria

2

Structure your review

The review form is divided into 5 sections. Please consider these when composing your review:

1. **BASIC REPORTING**
2. **EXPERIMENTAL DESIGN**
3. **VALIDITY OF THE FINDINGS**
4. General comments
5. Confidential notes to the editor

You can also annotate this PDF and upload it as part of your review

When ready submit online.

Editorial Criteria

Use these criteria points to structure your review. The full detailed editorial criteria is on your guidance page.

BASIC REPORTING

- Clear, unambiguous, professional English language used throughout.
- Intro & background to show context. Literature well referenced & relevant.
- Structure conforms to PeerJ standards, discipline norm, or improved for clarity.
- Figures are relevant, high quality, well labelled & described.
- Raw data supplied (see PeerJ policy).

EXPERIMENTAL DESIGN

- Original primary research within Scope of the journal.
- Research question well defined, relevant & meaningful. It is stated how the research fills an identified knowledge gap.
- Rigorous investigation performed to a high technical & ethical standard.
- Methods described with sufficient detail & information to replicate.

VALIDITY OF THE FINDINGS

- Impact and novelty not assessed. Negative/inconclusive results accepted. *Meaningful* replication encouraged where rationale & benefit to literature is clearly stated.
- Data is robust, statistically sound, & controlled.
- Speculation is welcome, but should be identified as such.
- Conclusions are well stated, linked to original research question & limited to supporting results.

Standout reviewing tips

3

The best reviewers use these techniques

Tip	*Example*
Support criticisms with evidence from the text or from other sources	*Smith et al (J of Methodology, 2005, V3, pp 123) have shown that the analysis you use in Lines 241-250 is not the most appropriate for this situation. Please explain why you used this method.*
Give specific suggestions on how to improve the manuscript	*Your introduction needs more detail. I suggest that you improve the description at lines 57- 86 to provide more justification for your study (specifically, you should expand upon the knowledge gap being filled).*
Comment on language and grammar issues	*The English language should be improved to ensure that an international audience can clearly understand your text. Some examples where the language could be improved include lines 23, 77, 121, 128 – the current phrasing makes comprehension difficult.*
Organize by importance of the issues, and number your points	*1. Your most important issue* *2. The next most important item* *3. …* *4. The least important points*
Please provide constructive criticism, and avoid personal opinions	*I thank you for providing the raw data, however your supplemental files need more descriptive metadata identifiers to be useful to future readers. Although your results are compelling, the data analysis should be improved in the following ways: AA, BB, CC*
Comment on strengths (as well as weaknesses) of the manuscript	*I commend the authors for their extensive data set, compiled over many years of detailed fieldwork. In addition, the manuscript is clearly written in professional, unambiguous language. If there is a weakness, it is in the statistical analysis (as I have noted above) which should be improved upon before Acceptance.*

Maternal correlates of cardiovascular risk in Hispanic children

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Background. Maternal obesity, physical inactivity, and negative perceptions of neighborhoods have been identified as obesogenic factors in older children; however, no study has explored this relationship in young Hispanic children. Furthermore, the relation between obesogenic maternal factors and blood pressure in Hispanic children has not been examined. This study aimed to assess the association between Hispanic mother's physical activity (PA), body mass index (BMI), and PA-related perceptions of neighborhoods and their children's PA, TV screen time, blood pressure (BP) and BMI. **Methods.** Data of 118 mother-child dyads enrolled in a cross-sectional study of metabolic syndrome in Hispanic children at a community health center in Johnson City, TN were used. Parent and child questionnaires were used to ascertain mother's BMI, PA, perception of the safety and availability of PA amenities in their children's neighborhoods, satisfaction with their children's neighborhoods as a place to bring up children, and children's PA and TV screen time. Children's height, weight, and BP were measured. Multiple logistic regression was used to examine the association between child and maternal variables, adjusting for mother's education and the child's sex and age. **Results.** Children of obese mothers were more likely than children of mothers with normal BMI to engage in less than three days of at least 60 minutes of vigorous PA per week (OR: 6.47: 95% CI: 1.61-26.0). Children whose mothers did not engage in moderate PA were more likely to engage in less than three days of at least 60 minutes of vigorous PA per week (OR: 2.92, CI: 1.18-7.24); and have elevated BP (OR: 2.50, 95% CI: 1.02-4.53) than children whose mothers engaged in moderate PA . **Discussion.** Our results suggest the need for interventions to help Hispanic mothers model physical activity and achieve and maintain healthy weight; if successful, these strategies could potentially influence their children's blood pressure and physical activity levels.

~~Maternal correlates of cardiometabolic risk in Hispanic children~~The influence of maternal BMI on physical activity of preadolescent Hispanic children

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Abstract

Background. Maternal obesity, physical inactivity, and negative perceptions of neighborhoods have been identified as obesogenic factors in older children; however, no study has explored this relationship in preadolescent~~young~~ Hispanic children. Furthermore, the relation between obesogenic maternal factors and blood pressure in Hispanic children has not been examined. This study aimed to assess the association between Hispanic mother's physical activity (PA), body mass index (BMI), and PA-related perceptions of neighborhoods and their children's PA, TV screen time, blood pressure (BP) and BMI.

Methods. Data of 118 mother-child dyads enrolled in a cross-sectional study of metabolic syndrome in Hispanic children at a community health center in Johnson City, TN were used. Parent and child questionnaires were used to ascertain mother's BMI, PA, perception of the safety and availability of PA amenities in their children's neighborhoods, satisfaction with their children's neighborhoods as a place to bring up children, and children's PA and TV screen time. Children's height, weight, and BP were measured. Multiple logistic regression was used to examine the association between child and maternal variables, adjusting for mother's education and the child's sex and age.

Results. Children of obese mothers were more likely than children of mothers with normal BMI to engage in less than three days of at least 60 minutes of vigorous PA per week (OR: 6.47: 95% CI: 1.61-26.0). Children whose mothers did not engage in moderate PA were more likely to engage in less than three days of at least 60 minutes of vigorous PA per week (OR: 2.92, CI: 1.18-7.24); and have elevated BP (OR: 2.50, 95% CI: 1.02-4.53) than children whose mothers engaged in moderate PA.

46 **Discussion.** Our results show a negative relationship between maternal BMI and preadolescent physical activity and a positive relationship between maternal BMI and preadolescent BP within Hispanic preadolescents. This suggests that ~~the need for~~ interventions aimed at improving Hispanic preadolescent physical activity and blood pressure may use maternal BMI as a modification strategy to obtain improved health in Hispanic preadolescents. ~~to help Hispanic mothers model~~

47 ~~physical activity and achieve and maintain healthy weight; if successful, these strategies could~~

48 ~~potentially influence their children's blood pressure and physical activity levels.~~

Introduction

Elevated blood pressure~~BP~~ (BP), physical inactivity and overweight in childhood can track into adulthood (McGill, McMahan, & Gidding, 2008; Napoli et al., 2006) and increase the risk of cardiometabolic diseases such as heart disease and stroke (Mozaffarian et al., 2016). Hispanic children experience higher prevalence of obesity and elevated BP (Falkner & Cossrow, 2014, ~~(~~Kit et al., 2015; Nguyen et al., 2015~~)~~)as compared to their non-Hispanic White peers. They ~~;~~ are more likely to experience earlier onset of obesity ~~at an early age~~and~~;~~ be severely obese (Mozaffarian et al., 2016)~~; and have higher prevalence of hypertension (Kit et al., 2015; Nguyen et al., 2015)~~as~~, ~~~~compared to their non-Hispanic White peers. T~~For example, t~~he prevalence of obesity among 2-to-18-year-olds in 2011-2014 was 14.7% for non-Hispanic White children ~~versus~~ and 21.9% for Hispanic children (Ogden, Carroll, Fryar, & Flegal, 2015). T~~; and t~~he prevalence of elevated BP among 8-to-17-year-olds in 2011-2012 was 9.4% for non-Hispanic White children ~~versus~~ and 11.5% for Hispanic children (Kit et al., 2015). Although the increased prevalence of these characteristics has been well documented and causal correlations to maternal atherosclerotic factors have been studied, a causal relationships between maternal BMI and their children's physical activity has yet to be investigated.

A positive energy balance resulting from a ~~complex~~ set of risk factors including poor diet, physical inactivity, genes, aging and ethnicity underlie the development of overweight and obesity (Rao, 2016). A similar set of risk factors including obesity, high dietary salt intake, male gender, older age, and ethnicity, drive the development of hypertension in children (Rao, 2016). In addition to these established risk factors, many studies have found an association between maternal physical activity (PA), body mass index (BMI), outdoor physical activity-related perceptions of neighborhoods and socio-economic status, and obesity and hypertension in older children (Durand et al., 2011; Gordon-Larsen et al., 2006; Rosendranz & Dzewaltowski, 2011; Sallis, Bowles, et al., 2009; Sallis, Saelens, et al., 2009; Van Den Berg et al., 2013). Neighborhoods perceived by parents as less safe and lacking amenities for PA are associated

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72 with overweight (Bacha et al., 2010; Mendoza, McLeod, Chen, Nicklas, & Baranowski, 2014;

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Miranda, Edwards, Anthopolos, Dolinsky, & Kemper, 2012; Singh, Kogan, Van Dyck, & Siahpush, 2008; Taveras, Matthes, & Kleinman, 2010). Previous studies have also identified maternal physical activity and obesity as risk factors for obesity in older children (Fuemmeler, Anderson, & Mâsse, 2011; Ruiz, Gesell, Buchowski, Lambert, & Barkin, 2011; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997).

However, ~~to the best of our knowledge,~~ no study has examined the effect of maternal~~other's~~ BMI, PA and neighborhood perceptions ~~or BMI~~ on ~~children's~~ Hispanic preadolescent BMI, PA, BP. ~~Furthermore, to our knowledge, no study has examined the influence of maternal PA, BMI and neighborhood perceptions on the BP and BMI of Hispanic children as young as two years old.~~

~~Based on the above-mentioned gaps in the literature,~~ Therefore, ~~t~~this study tests two related hypotheses: First, if mothers express satisfaction with their children's neighborhoods as a place to raise children and perceive the neighborhoods as safe and having amenities, then ~~they~~ mothers are more likely to encourage ~~more~~ PA for their preadolescent children, ~~which will lead to their children having less screen time (TV or video), more PA and lower prevalence of overweight and elevated BP.~~ Second, obese mothers who self-report to be ~~engage in~~ less physically active~~PA and are obese~~ are less likely to ~~model PA; and their~~ self-report their preadolescent children ~~will be less~~as physically active and are more likely to self-report their preadolescent children as having ~~, have~~ more screen time. An increased maternal weight is associated with increased preadolescent weight and BP in Hispanic children. ~~and higher prevalence of overweight and elevated BP.~~

Materials & Methods

Data Source and Participants

Data for this study came from a cross-sectional pilot study of metabolic syndrome in Hispanic

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94 children, ages 2-10 years, who presented for well-child care at a community health center in

Johnson City, TN, from June 2015 to June 2016, accompanied by their mothers. The study was reviewed and approved by the Institutional Review Board of the East Tennessee State University (IRB#: 0414.16s).

Of the original 150 children, 21 of a set of 21 pairs of siblings and four of a set of two sets of three siblings were randomly eliminated. Siblings were included in the initial sample because basic science researchers on the multidisciplinary team were interested in studying siblings. Two children with BMI below the fifth percentile were also excluded because of this study's focus on normal BMI or overweight. An additional five children who did not have BMI and or BP data were removed. The final analytic sample consisted of 118 children.

Data Collection Methods

A pediatric nurse identified potentially eligible mother-child dyads two days before the well-child visit. Inclusion criteria for children were: being 2-10 years of age; Hispanic, as defined by the U.S. Census Bureau; and not having a serious physical or mental illness. A research staff met with potentially eligible children and their mothers the day of their visit and sought their interest in the study. Mothers interested in the study were provided written information about the study in either Spanish or English language. Mothers understood that participation in the study was voluntary and received assurance of the confidentiality of the data which they provided. Mother's written consent and a child written assent from children seven years and older, were obtained before data collection.

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Example: "Mother-child dyads were provided written and oral information on the study protocols and purpose and thereto were requested to provide written voluntary informed consent; all of which consented. Children seven years or older and mothers were required to provide written informed consent to proceed with the study."

A trained research staff used a set of child and parent questionnaires to collect child and parent socio-demographic, PA, TV screen time, and neighborhood data. Mother's height and

weight were reported in the parent questionnaire. Questionnaires were administered in English or Spanish language and the mother was the respondent. A pediatric nurse practitioner measured children's height, weight and BP using standard protocol (Centres for Disease Control and Prevention, 2007). A standard scale which was tested and calibrated daily for accuracy was used to measure weight to the nearest 0.2 pounds; a stadiometer was used to measure height to the nearest one-eighth of an inch; and auscultation with a stethoscope and a standard clinical mercury sphygmomanometer was used to measure child BP after the child rested for at least five minutes.

Outcome Measures

Child systolic and diastolic BP percentiles were obtained from CDC blood pressure charts and categorized as: 1. normal BP (systolic or diastolic BP < 90th percentile) and 2. elevated BP (systolic or diastolic BP >= 90th percentile) (Falkner et al., 2004). Child BMI percentiles were calculated using the 2000 CDC growth charts (CDC, Age-based Pediatric Growth Reference Charts, 2000)**.** Participants were grouped as: 1. underweight (less than 5th percentile), 2. Healthy weight (5th-84th percentiles), 3. Overweight (>= 85th-94th percentiles), and 4. obese (>= 95th percentile) (CDC, Aged-based Pediatric Growth Reference Charts, 2000)**.** ~~Two underweight children were removed from the analytic sample because of the study's focus on normal weight and overweight children.~~ The remaining three BMI categories were collapsed into two categories: 1. normal weight children (5th through 84th percentile) and 2. Overweight and obese children which included children with BMI from 85th percentile and above, for age and sex.

Child PA was assessed by the question: "*during the past 7 days, on how many days was your child physically active for a total of at least 60 minutes per day? Add up all the time he/she spent in any kind of physical activity that increased his/her heart rate and made him/her breathe*

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142 *hard some of the time"* (National Center for Health Statistics, 2013). The responses ranged from
143 0 to 7 days. We categorized the number of days of children's PA in a week using recommended
144 guidelines (U.S. Department of Health and Human Services, 2008), however, because of the
145 small sample size and distribution of responses, the variable was categorized as: 1. < 3 days of
146 vigorous PA per week and 2. >= 3 days of vigorous PA per week.

147 Child screen time (TV and video) was assessed by the question: *"over the past 30 days,*
148 *on average how many hours per day did your child sit and watch TV or videos*" (National Center
149 for Health Statistics, 2013). The responses ranged from 0 to 8. Based on the American Academy
150 of Pediatrics' recommendation, the variable was categorized as: 1. <= 2 hours per day and 2. > 2
151 hours per day (American Academy of Pediatrics, 2010).

152

153 ***Neighborhood Safety and Amenities Measures***

154

155 Mother's perception of neighborhood safety combined responses to the following statements: 1.
156 "*it is safe for children to play outside during the day*" and 2. "*It is safe to walk alone in this*
157 *neighborhood (town or village) after dark*" (Statistics Canada, 2009b). Cronbach's alpha for
158 each item on the scale (Statistics Canada, 2009a) was greater than 0.7 for children 2-15 years
159 old. The response categories to both questions were: 1. completely agree, 2. Agree, 3. Disagree
160 and 4. Completely disagree. No respondent chose '4. Completely disagree'. Neighborhood safety
161 was computed as follows: 1. completely safe, if responses to both safety items were 1; 2. Safe, if
162 responses were 1 and 2 or 2 and 2; and 3. Unsafe, if response to either safety question included 3.

163 Mothers rated their satisfaction with the neighborhoods in which their children live as a
164 place to raise children as follows: 1. Excellent, 2. Somewhat good, 3. Average, 4. Somewhat bad,
165 and 5. Very bad (Statistics Canada, 2009b). There were no responses for categories 4-5,

Somewhat bad and Very bad. Because of the small number of responses in category 3, it was combined with category 2 to create two response categories: 1. Excellent and 2. Somewhat good or average.

Perceived availability of amenities in the neighborhood was assessed by the statement: "*There are enough parks, playgrounds and green spaces in your neighborhood*" (Statistics Canada, 2009b). Valid responses were: 1. Yes or 2. No.

Mother's BMI and Physical Activity

Mother's BMI was calculated and categorized as: healthy (18.5 kg/m^2 <= BMI <= 24.9 kg/m^2) 2. Overweight (25 kg/m^2 <= BMI <= 29.9 kg/m^2) and 3. Obese (BMI >= 30 kg/m^2) (Centers for Disease Control and Prevention, 2015). Mother's PA was assessed by the question: "*in a typical week, do you do any moderate-intensity sports, fitness, or recreational activities which cause a small increase in breathing or heart rate such as brisk walking, bicycling, swimming, or golf for at least 10 minutes continuously?"* (National Center for Health Statistics, 2013). The responses were: 1. Yes or 2. No.

Sociodemographic Measures

Child age was computed as completed years from reported date of birth. Child sex was reported as either male or female. Age was categorized as: 1. 2-5 and 2. 6-10 years to reflect developmental, biological and social differences by age. Educational attainment has been used as a proxy for socioeconomic status (Hendrie, Sohonpal, Lange, & Golley, 2013) because income levels increase with higher educational attainment. Mother's education was used as a proxy for mother's socioeconomic status and categorized as: 1. less than 9^{th} grade 2. 9^{th}-11^{th} grade 3. High

school graduate/GED or equivalent and 4. Some college, AA degree or above. Birth place of child was categorized as: 1. Tennessee, 2. elsewhere in the U.S outside Tennessee and 3. Outside the U.S. Hispanic origin of child was categorized as: 1. Mexican-American and 2. Other, including Puerto-Rican, Argentine, Columbian, Guatemalan, Ecuadorian and El-Salvadorian.

Statistical Analyses

Chi-squared and Fisher's exact tests were used to examine differences in the prevalence of elevated BP and overweight by sociodemographic subgroups, and the relationship between mother's BMI status, PA, perceptions of the neighborhood and children's PA, BP and BMI. Chi-squared and Fisher's exact tests were also used to examine bivariate associations between children's PA, BP, BMI and TV viewing. Independent variables with a P value < 0.20 in univariate associations were entered in multiple logistic regression models of child BMI and child BP; these models were adjusted for mother's education, age and marital status. Alpha less than 0.05 was set as the threshold for statistically significant associations. Data analysis was performed in statistical analyst system (SAS version 9.4).

Results

The mean age of the children was 6.36 years (*SD*=2.75) and half ~~(50%)~~ were ~~girls~~ female (Table 1).

Children subjects were identified as 76.3% Mexican-American, 23.7% other Hispanic origin. About three quarters (76.3%) of children were identified as Mexican-American; and nearly one-quarter (23.7%) were identified as other Hispanic origin (Puerto Rican, Guatemalan, Ecuadorian and Columbian). Most participants (89.8%) were born in the U.S (consisting of 69.5% born in Tennessee and 20.3% born in other states) (Table 1). About eighty nine percent (88.9%) of mothers had no education beyond high school or the equivalent of high school (Table 1).

About a third (31.4%) of children had elevated BP, and about 4 out of 10 (40.7%) were overweight. About a fifth (22.0%) of children watched TV or videos for two or more hours on a typical day, and just over a quarter (26.3%) engaged in less than three days of sixty or more minutes of vigorous PA per week (Table 1).

Two-to-five-year-old children had 23.5% higher prevalence of elevated BP compared to 6-to-10-year-olds (45.7% vs. 22.2%, p=0.007) (Table 1). Children whose mothers did not engage in moderate PA had 15.5% higher prevalence of elevated BP (38.7% vs. 23.2%, p=0.07) (Table 2); and 14.5% higher prevalence of engaging in less than three days of at least 60 minutes of vigorous PA per week, (33.9% vs. 19.4%, p=0.072) (Table 2), than children whose mothers engaged in moderate PA. Children whose mothers did not engage in moderate PA had 12.9 % higher prevalence of overweight than children whose mothers engaged in moderate PA, (46.8% vs. 33.9%, p=0.08). Table 3 shows bivariate associations between children's PA, TV viewing, BP and BMI. Children's BMI and BP were significantly associated (p=0.046).

In adjusted multiple logistic regression, children of obese mothers were 6.47 times more likely than children of mothers with normal BMI to engage in less than three days of at least 60 minutes of vigorous PA per week (95% CI: 1.61-26.0) (Table 4). Children whose mothers did not engage in moderate PA were 2.92 times more likely to engage in less than three days of at least 60 minutes of vigorous PA per week (OR: 2.92, CI: 1.18-7.24); and 2.5 times more likely to have elevated BP (OR: 2.50, 95% CI: 1.02-4.53) than children whose mothers engaged in moderate PA (Table 4).

There was a trend for children from neighborhoods perceived as least safe to be more likely to engage in less than three days of at least 60 minutes of vigorous PA per week than their peers from neighborhoods perceived as most safe (OR: 2.93: 95% CI: 0.95-9.01); and for

children whose mothers rated their neighborhoods less highly as places to raise children to be more likely to be overweight or obese, than children whose mothers rated their neighborhoods more highly as places to raise children (OR: 2.07: 95% CI: 0.96-4.44) (Table 4)

Discussion

In this study, we found that about four out of every ten children were overweight or obese (40.7%), and about three out of every ten had elevated BP (31.4%). The study sample prevalence of overweight is similar to national estimates for Hispanic children (Ogden et al., 2014). Estimates of the prevalence of elevated BP in children are few and difficult to compare. In a large cohort study of 3-to-18-year-old children presenting for well-child care, Hansen, Gunn and Kaelbar (2007) determined the prevalence of elevated BP to be 7.0%. A study by Ma, Zhang and Xi (2016) using NHANES 2013-2014 data reported the prevalence of elevated BP in 8-to-17-year-olds to be 7.0%. Kit et al. (2015) also using NHANES data estimated the prevalence of elevated BP in 8-to-17-year-old children to be 11.0% in 2011-2012. The prevalence of elevated BP in this study exceeds estimates from these previous studies. One explanation is the low socioeconomic status of participants. About 89% of mothers had only a high school education or less. Low socio-economic status is associated with significantly higher obesity and hypertension (Brummett et al., 2011; Van Den Berg et al., 2013).

This study also found that children of obese mothers were 6.47 times more likely than children of mothers with normal BMI to engage in less than three days of at least 60 minutes of vigorous PA per week; and children whose mothers did not engage in moderate PA were 2.92 times more likely to engage in less than three days of at least sixty minutes of vigorous PA than children whose mothers engaged in moderate PA. Our findings comport with previous studies

which have found strong mother-child correlations in PA and a strong association between maternal obesity and child PA. In a study of 3-to-5-year-old Hispanic children and their mothers at a local community center in Nashville, TN, Ruiz, Gessel, Buchowski, Lambert and Barkin (2011) observed strong mother-child correlation in sedentary behavior and moderate PA; Fuemmeler, Anderson and Masse (2011) found a high correlation of moderate-to-vigorous PA (MVPA) between mothers and their children. Rosendranz and Dzewaltowski (2011) found that mother-child shared PA was negatively associated with child BMI percentile, and that maternal BMI was positively correlated with child BMI. The same study evaluated the effects of PA-related-parenting behaviors such as encouragement, transporting the child for PA and watching the child do PA. Of all PA-related-parenting behaviors, PA encouragement had the strongest correlation with child PA.

We also found that children whose mothers did not engage in moderate PA were 2.5 times more likely to have elevated BP than children whose mothers engaged in moderate PA. Physical inactivity and overweight are risk factors for elevated BP in children (Ewald & Haldeman, 2016; Gopinath, Hardy, Kifley, Baur, & Mitchell, 2014; Leary et al., 2008). However, after controlling for child PA, and BMI, children whose mothers did not engage in moderate PA remained significantly more likely to have elevated BP than children whose mothers engaged in whose moderate PA. To the best of our knowledge, this is the first study to report a significant association between maternal PA and child BP in Hispanic children, independent of child's BMI and PA.

We did not find significant associations between mother's perception of neighborhood safety, and mother's rating of the neighborhood as a place to raise children and children's PA, BP or BMI; however, there was a trend with children from neighborhoods perceived as least safe

being more likely to engage in less than three days of at least sixty minutes of vigorous PA per week than their peers from neighborhoods perceived as most safe; and children whose parents rated their neighborhoods less highly as places to raise children more likely to be overweight or obese, than children whose mothers rated their neighborhoods more highly as places to raise children. Previous studies which examined the association between mothers perceived neighborhood safety, neighborhood amenities and their children's PA and BMI, have found mixed results. In a large multi-ethnic study of 2-to-8-year-old children in Durham, North Carolina, Miranda et al. (2012) found that higher levels of neighborhood crime and nuisance were associated with significantly higher risk of overweight in children. Likewise, Singh et al. (2010) found that children living in neighborhoods which were unsafe and had no PA amenities had 20%-60% higher odds of being obese than their peers from more favorable neighborhoods, while Datar, Nicosia and Shier (2013) found higher rates of TV viewing and less PA in children whose parents perceived their neighborhoods as less safe. In contrast, in a cross-sectional survey of more than 3,000 children in 20 large U.S cities, maternal perception of neighborhood safety was not found to be associated with their children's outdoor play time or risk for obesity (Burdette & Whitaker, 2005); and in the study by Datar et al. (2013) maternal perception of neighborhood safety was not associated with their children's obesity risk.

This study has some limitations. The sample size was relatively small; hence the study may have lacked power to reach significance for some of the associations. Second, being a cross-sectional study of predominantly Mexican-Americans, our findings may not be generalizable to all Hispanic children and do not indicate causality. Third, our inability to control for diet may potentially confound our findings. However, these weaknesses should be weighed against the strengths of this study. To the best of our knowledge, this is the first study which has assessed

the prevalence and sociodemographic correlates of elevated BP in Hispanic children in Tennessee.

Conclusions

The prevalence of overweight and elevated BP among Hispanic preadolescent subjects~~in the sample~~, especially in 2-to-5-year-olds ~~were~~ was higher than expected ~~and thus very concerning~~. Low maternal PA was associated with elevated BP and lower PA in ~~children~~preadolescent children; likewise, maternal obesity was associated with lower PA in preadolescent children. Our findings suggest the need for public health interventions that would encourage mothers to increase physical activity~~aternal modelling of PA an~~d improve weight control as a means for ~~potentially~~ reducing obesity and hypertension in Hispanic preadolescent children.

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Acknowledgments The authors would like to thank all families who voluntarily participated in this study.

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Conflict of Interest The authors declare that they have no conflict of interest.

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Table 1 (on next page)

Sociodemographic characteristics of children by cardiometabolic risk factor (N=118)

Commented [GQ13]: Cardiovascular vs. Cardiometabolic RF vs. Obesogenic vs. Atherosclerotic. Pick a term and hone in on it. These all have different meanings. Try to refrain from introducing new terms into the article unless they are essential to the article.

1

Sociodemographic characteristics of children by cardiometabolic risk factor (N=118) [a]

Characteristic, n (%)	n (%) Total	Elevated BP n (%)		Overweight n (%)		>2hrs TV/day n (%)		<3 Days PA/Wk n (%)	
			p-value[b]		p-value[b]		p-value [b]		p-value [b]
n (%) Total	118(100.0)	37(31.4)		48(40.7)		26(22)		31(26.3)	
Sex, n (%)			0.17		0.45		0.66		0.83
Male	59(50.0)	22(37.3)		26(44.1)		14(23.7)		16(27.1)	
Female	59(50.0)	15(25.4)		22(37.3)		12(20.3)		15(25.4)	
Age group, n (%)			0.007		0.47		0.33		0.70
2-5 years	46(39.0)	21(45.7)		18(39.1)		8(17.4)		13(28.3)	
6-10 years	72(61.0)	16(22.2)		30(41.7)		18(25)		18(25)	
Mother's education, n (%)			0.95		0.93		0.10		0.27
<9th grade	53(44.9)	18(34.0)		23(43.4)		12(22.6)		14(26.4)	
9-11th	20(16.9)	6(30.0)		7(35.0)		4(20)		2(10.0)	
High school/GED	32(27.1)	9(28.1)		13(40.6)		4(12.5)		11(34.4)	
>=Some college	13(11.0)	4(30.0)		5(38.5)		6(46.2)		4(30.8)	
Hispanic Origin, n (%)			0.57		0.86		0.67		0.19
Mexican-American	90(76.3)	27(30.0)		37(41.1)		19(21.1)		21(23.3)	
Other [c]	28(23.7)	10(35.7)		11(39.3)		7(25)		10(35.7)	
Birth Place, n (%)			0.085		0.94		0.018		0.37
Tennessee	82(69.5)	31(37.8)		34(41.5)		13(15.9)		19(23.2)	
Elsewhere in U.S.	24(20.3)	4(16.7)		9(37.5)		7(29.2)		7(29.2)	
Outside U.S.	12(10.2)	2(16.7)		5(41.7)		6(50)		5(41.7)	

[a] Data from a study of metabolic syndrome in Hispanic children, at a community health center in Johnson City, TN, June 2015 to June 2016
[b] p-value from chi-squared or Fisher's exact test
Abbreviations: BP=Blood Pressure; >2hrs TV/day=greater than an average of 2 hours of watching TV or videos in the past 30 days; < 3Days PA/Wk=Less than 3 days of physical activity for at least 60 minutes per day in the past 7 days
[c] Other Hispanic origin (Puerto-Rican, Argentine, Columbian, Guatemalan, Argentine, Ecuadorian and El-Salvadorian)

Commented [GQ14]: Worth commenting. If not commenting, do not include in table.

Commented [GQ15]: What is the relevance of birth place? If relevant, statements regardinf

Table 2(on next page)

Maternal neighborhood perception, BMI, physical activity and children's cardiometabolic risk (N=118)

1

Maternal neighborhood perception, BMI, physical activity and children's cardiometabolic risk (N=118) [a]

Characteristic (n %)	n (%) Total	Elevated BP n (%)		Overweight n (%)		>2hrs TV/day n (%)		<3 Days PA/Wk n (%)	
			p-value [b]		p-value [b]		p-value [b]		p-value [b]
Neighborhood rating, n (%)			0.46		0.052		0.845		0.213
Excellent	57(48.3)	16(28.1)		18(31.6)		13(22.8)		12(21.1)	
Somewhat good/average	61(51.7)	21(34.4)		30(49.2)		13(21.3)		19(31.1)	
Neighborhood safety [c], n (%)			0.73	19(39.6)	0.98		0.73		0.179
Completely agree	48(40.7)	17(35.4)		17(41.5)		12(25.0)		9(18.8)	
Agree	41(34.7)	12(29.3)		12(41.4)		9(22.0)		11(26.8	
Disagree	29(24.6)	8(27.6)				5(17.2)		11(37.9)	
Moderate PA by mother, n (%)			0.07		0.08		0.551		0.072
Yes	62(52.5)	13(23.2)		19(33.9)		11(19.6)		12(19.4)	
No	56(47.5)	24(38.7)		29(46.8)		15(24.2)		19(33.9)	
Mother's BMI, n (%)			0.15		0.25		0.31		0.003
Normal	25(21.2)	10(40.0)		9(36.0)		7(28.0)		3(12.0)	
Overweight	47(39.8)	10(21.3)		16(34.0)		7(14.9)		8(17.0)	
Obese	46(39.0)	17(37.0)		23(50.0)		12(26.1)		20(43.5)	
Enough PA amenities [d], n (%)			0.88		0.20		0.23		0.916
Yes	106(89.8)	33(31.1)		41(38.7)		25(23.6)		28(26.4)	
No	12(10.2)	4(33.3)		7(58.3)		1(8.3)		3(25.0)	

[a] Data from a study of metabolic syndrome in Hispanic children at a community health center in Johnson City, TN, June 2015 to June 2016
[b] p-value from chi-squared or Fisher's exact test
Abbreviations: BP=Blood Pressure; >2hrs TV/day=Greater than an average of 2 hours of watching TV or videos in the past 30 days; < 3Days PA/Wk =Less than 3 days of physical activity for at least 60 minutes per day in the past 7 days
[c] Neighborhood safety combined responses to: 1. it is safe for children to play outside during the day and 2. It is safe to walk alone in this neighborhood (town or village) after dark.
[d] There are enough parks, playgrounds and green spaces in your neighborhood

Table 3(on next page)

Bivariate associations between children's physical activity, TV viewing, blood pressure and BMI categories (N=118)

Bivariate associations between children's physical activity, TV viewing, blood pressure and BMI categories (N=118) [a]

Characteristic	Elevated BP n (%)		Overweight n (%)		>2 Hrs TV/day n (%)		<3 Days PA/WK n (%)	
		p-value		p-value		p-value		p-value
Blood pressure								0.30
Normal	//		//		//		19(23.5)	
Elevated	//		//		//		12(32.4)	
Child BMI		0.046						0.87
Normal	17(24.3)		//		//		18(25.7)	
Overweight	20(41.7)		//		//		13(27.1)	
TV viewing		0.17		0.85		0.93		
> 2 hours	26(28.3)		11(42.3)		7(22.6)		//	
< 2 hours	11(42.3)		37(40.2)		19(21.8)		//	

//: Bivariate association is either not of interest or appear on a different row in this same table

[a] Data from a study of metabolic syndrome in Hispanic children at a community health center in Johnson City, TN, June 2015 to June 2016

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Table 4(on next page)

Odds ratios and 95% confidence intervals for maternal neighborhood perception, BMI and physical activity and overweight and elevated blood pressure in children (N=118)

1

Odds ratios and 95% confidence intervals for maternal neighborhood perception, BMI and physical activity and overweight and elevated blood pressure in children (N=118) [a]

	<3 days of PA/WK	Overweight or Obese	Elevated BP
	OR (95% CI) [b]	OR (95% CI) [b]	OR (95% CI) [c]
Age group			
2-5 vs 6-10 years	0.24(0.04-1.33)	0.90(0.40-2.02)	4.45(1.68-11.78)
Male vs Female	0.70(0.27-1.84)	1.32(0.61-2.87)	2.06(0.82-5.21)
Mother's Education			
< 9th grade (ref)			
9-11th grade	0.24(0.04-1.33)	0.74(0.24-2.25)	0.75(0.21-2.68)
High school/GED	2.44(0.77-7.79)	0.83(0.33-2.13)	0.548(0.17-1.68)
>= Some college	1.02(0.21-5.01)	0.83(0.223.13)	1.14(0.25-5.20)
Neighborhood safety			
completely agree(ref)			
agree	1.55(0.54-4.37)	na	na
disagree	2.93(0.95-9.01)	na	na
Moderate PA by mother			
yes(ref)			
No	2.92(1.18-7.24) **	1.77(0.82-3.83)	2.50(1.02-4.53) **
Mother's BMI			
Normal(ref)			
Overweight	1.20(0.28-5.27)	na	0.41(0.13-1.27)
Obese	6.47(1.61-26.0) ***	na	0.70(0.24-2.02)
Neighborhood Rating			
excellent(ref)			
somewhat good/average	na	2.07(0.96-4.44)	na

[a] Data from a study of metabolic syndrome in Hispanic children at a community health center in Johnson City, TN, June 2015 to June 2016
[b] adjusted for mother's education, child's age, sex,
[c] Adjusted for mother's education, child's sex, age, BMI, and TV viewing
Abbreviations: BP=Blood Pressure; >2hrs TV/day=Greater than an average of 2 hours of watching TV or videos in the past 30 days; < 3Days PA/Wk=Less than 3 days of physical activity for at least 60 minutes per day in the past 7 days; na=not tested in multiple logistic regression because alpha of univariate association between variables was >= 0.20
** p-value < 0.05, *** p-value < 0.01