

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	The Impact of Non-Menthol Flavors in E-Cigarettes on Perceptions and Use: An Updated Systematic Review
<b>AUTHORS</b>	Meernik, Clare; Baker, Hannah; Kowitt, Sarah; Ranney, Leah; Goldstein, A;

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Deepa Camenga Yale School of Medicine, USA
<b>REVIEW RETURNED</b>	07-Jun-2019

<b>GENERAL COMMENTS</b>	<p>This study is a systematic review of studies examining the impact of non-menthol e-cigarette flavors on e-cigarette perceptions and use among youth and adults. It aims to review observational and experimental studies that assess the effect of non-menthol flavors on perceptions and use behaviors. It updates a 2017 Huang et al systematic review in Tobacco Control by examining literature published since 2016.</p> <p>Of note, the citation numbering in Table 1 does not match the citation numbering in Supplementary Table 1 nor the text. The authors need to check all reference numbering and make sure they are correct throughout the document.</p> <p>Abstract Results: Per the methods, the study focuses on youth and adults (as defined by each study) however the abstract includes young adults. I think this is an error.</p> <p>Introduction: Page 4- lines 28-37: There needs to be a greater discussion of how this review "extends previous research" (ie provides an update by including recent research published between 2016-2018)</p> <p>Methods Was an interrater reliability assessment performed?</p> <p>Results Page 23- Many of the studies regarding adult quit intentions and quitting behaviors examine menthol flavors</p> <p>Discussion: Although the methods state that the variability in definition of young adults made it difficult to separate this group as unique from adults, the discussion does make conclusions about young adults (ie page 24 lines 41-43 and Abstract, as stated above). If able to make conclusions about young adults, it would seem that a specific analysis of the young adult data could be made (or at least the investigator-defined groups of young adults)</p>
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	<p>Page 25- paragraph 2- this paragraph seems out of scope of the rest of the paper, as it focuses on general tobacco control measures to curb youth e-cigarette use, not specifically on flavors. Consider cutting this section or making a closer connection between these policy initiatives and flavors.</p> <p>Minor comments-</p> <p>page 4-" ...7000 flavors existing" needs a supporting citation</p> <p>page 5 line 5-6 should be e-cigarettes rather than flavored tobacco products as this paper focuses on e-cigarettes only</p>
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<b>REVIEWER</b>	Julia Chen-Sankey NIMHD, US
<b>REVIEW RETURNED</b>	07-Jun-2019

<b>GENERAL COMMENTS</b>	<p>This is an updated systematic review of the role of non-menthol e-cigarette flavors on the perceptions and use of tobacco products. The authors provided a comprehensive analysis of new studies on non-menthol flavored e-cigarettes and scored the articles based on its quality. The paper is very well written and the methods of this systematic review weren clearly described. I provided comments below based on the paper section.</p> <p>Introduction:</p> <ul style="list-style-type: none"> <li>- Since this systematic review also included articles from other countries other than the U.S., the authors may add a sentence of two to describe the prevalence and use patterns of flavored e-cigarettes in some other countries.</li> <li>- Since the authors were interested in only examining non-menthol flavors, in the methods section, the authors need to explicitly mention "flavors" as "non-menthol flavors" (menthol is still considered as a characterizing flavor in tobacco products so the authors need to be clear here). The authors may also need to further explain why menthol flavors are excluded from this systematic review (this can take place in the Introduction section or the methods section).</li> <li>- Additionally, the authors may need to explain why "tobacco" is not considered as a flavor in this scenario although e-liquid bottles and e-cigarette products often label "tobacco" as a flavor.</li> </ul> <p>Methods:</p> <ul style="list-style-type: none"> <li>- More rationale is needed for excluding studies using qualitative research methods. Qualitative methods may be especially useful to understand the role of e-cigarette flavors in the perceptions of e-cigarette products among youth and young adults.</li> <li>- Although it is clear that this analysis tightly followed the methods of the first paper, it might be helpful to include the key search terms in the methods section again since this is an independent paper from the former one.</li> <li>- The authors need to further explain why QATSDD was chosen as a quality assessment tool since some readers might not be familiar with this tool.</li> <li>- For types of measures, it will be great if the authors can further explain why these specific outcomes were chosen. Were there any health behavior theory or tobacco use progression model that the authors used to form the selection of the outcomes?</li> <li>- Although the authors used PRISMA as a standard approach for systematic review, this method was not mentioned at all in the text of the methods section but only in the figure.</li> </ul>
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	<p>Results:</p> <ul style="list-style-type: none"> <li>- This may be a little too demanding and require more data coding and analysis, but this review can be largely improved by assessing the study findings by e-cigarette flavor types. The authors mentioned the specific flavors in some findings but not consistently throughout the results section. The authors may use Yingst article (Yingst, J. M., Veldheer, S., Hammett, E., Hrabovsky, S., &amp; Foulds, J. (2017). A method for classifying user-reported electronic cigarette liquid flavors. <i>Nicotine &amp; Tobacco Research</i>, 19(11), 1381-1385) to characterize e-cigarette flavors and group the flavors accordingly. This may be especially important given that existing articles used various methods of measuring flavors-- some grouped all the non-menthol flavors together and some separated them; some only examined individual flavors and some included all flavors. Doing so, this review may have the potential to inform flavored tobacco regulation-making (especially as some e-cigarette flavors may be particularly appealing and some other flavors useful for cigarette smoking cessation). Otherwise, the authors are encouraged to add a sentence or two in the discussion section about the variety of e-cigarette flavor categorization and how this inconsistency may create a problem to compare and contrast the study results (maybe also what future studies can do to overcome these challenges).</li> </ul> <p>Discussion:</p> <ul style="list-style-type: none"> <li>- Again, the authors need to be clear that the “flavors” discussed here do not include menthol flavors.</li> <li>- The authors expanded extensively on potential policy options of regulating flavored e-cigarettes; however, this is not a policy paper. The discussion section may be more relevant if the authors can deliberate how future studies can be improved to achieve higher research qualities based on the QATSDD tool. For example, not a lot of studies adopted a theoretical framework. The authors can provide the rationale of why providing such frameworks is important for understanding the role of e-cigarette flavors and which theories and models may be helpful. The authors can also recommend using PATH youth and adult surveys to assess longitudinal use of flavored e-cigarettes (and by flavor types) and outcomes since there is a lack of longitudinal studies.</li> <li>- Since this review included articles from countries all over the world, the authors need to be clear about the results in the Discussion section. The authors may link the results from other countries to the specific countries’ regulation progress on flavored e-cigarettes.</li> <li>- Since this review is an update of a published review, the authors are encouraged to compare the results of these two reviews beyond only study numbers. What are the recent articles more likely to focus on compared to the old articles and what does this difference imply for the field of tobacco control research?</li> <li>- A more comprehensive view on the localities restricting the sale of flavored e-cigarettes can be found from this article: Chen, J. C., Green, K. M., Chen, J., Hoke, K. S., &amp; Borzekowski, D. L. (2018). Restricting the Sale of Flavored E-cigarettes in the US: An Examination of Local Regulations. <i>Tobacco Regulatory Science</i>, 4(4), 32-40.</li> <li>- In Conclusions, the authors may also mention more research is needed to assess the harm (entice youth to vape) and benefits (help adults transition off cigarettes) of using flavored e-cigarettes.</li> </ul>
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## VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

1) Of note, the citation numbering in Table 1 does not match the citation numbering in Supplementary Table 1 nor the text. The authors need to check all reference numbering and make sure they are correct throughout the document.

Author response: Thank you for pointing this out, we have updated the citations.

2) Abstract Results: Per the methods, the study focuses on youth and adults (as defined by each study) however the abstract includes young adults. I think this is an error.

Author response:

Thank you for pointing this out, and we agree that it is confusing. Because young adults are defined differently across articles, we collapsed both categories of young adults and adults into a single adult category for purposes of analysis. However, throughout our review we still identify young adults separately if defined in that way by the article. To reduce confusion in the abstract, we deleted “among youth and young adults” and just maintained the following: “increase willingness to try and initiation of e-cigarettes (6 studies)”.

3) Introduction:

Page 4- lines 28-37: There needs to be a greater discussion of how this review "extends previous research" (ie provides an update by including recent research published between 2016-2018)

Author response:

Thank you for the opportunity to provide additional context to this issue. We have added the following information to the Discussion section:

This new review significantly expands earlier findings about e-cigarettes and flavor among youth and adults. The previous review showed initial evidence that flavors in e-cigarettes were primary reasons for willingness to try or use the products. This expanded systematic review includes emerging longitudinal data and adds evidence on the role of flavors in e-cigarettes among youth and adults. Among youth, flavors increase not only preferences for e-cigarettes, but they also increase e-cigarette product appeal, willingness to use, susceptibility to use, and initiation, as well as decrease e-cigarette product harm perceptions. Among adults, the expanded research now shows that e-cigarette flavors increase product appeal and enjoyment, and the availability of flavors are a primary reason for use for many adults. Further, our quality review process provides important insight for researchers in this field to improve the rigor of e-cigarette research and includes essential information on study sample size and the reliability or validity of measures.

We have also modified the following sentence in the Introduction section:

Given this changing landscape, we conducted a systematic review of non-menthol flavored e-cigarettes that extends previous research by providing evidence specific to e-cigarettes about the role of non-menthol flavors in appeal, harm perceptions, intentions, use, and cessation among youth and adults in the US and globally.

4) Methods Was an interrater reliability assessment performed?

Author Response:

Thank you for your question. There was no interrater reliability assessment performed, although 2 of the 3 reviewers had worked together on the initial review and therefore had experience working together to assess articles for both reviews, and the study team had multiple discussions related to article assessment.

Results

5) Page 23- Many of the studies regarding adult quit intentions and quitting behaviors examine menthol flavors

Author response:

Thank you for pointing this out. A few of the studies included an examination of menthol flavors in their research and at times they did not disaggregate the non-menthol flavors from menthol flavors, or they were comparing non-menthol flavors to menthol flavor. Therefore, we report on these results because ultimately they include non-menthol flavors. We have attempted to update the text in this section where possible to show only results for non-menthol flavors. We also wrote in the methods that "...this review excludes articles that examined just menthol as a flavor".

6) Discussion:

Although the methods state that the variability in definition of young adults made it difficult to separate this group as unique from adults, the discussion does make conclusions about young adults (ie page 24 lines 41-43 and Abstract, as stated above). If able to make conclusions about young adults, it would seem that a specific analysis of the young adult data could be made (or at least the investigator-defined groups of young adults)

Author response:

Thank you for pointing this out. We have deleted the wording about young adults in the Abstract, and updated the specified sentences in the Discussion as follows:

"Findings highlight the following: youth prefer non-tobacco flavored e-cigarettes;62,63,67,68 flavors—particularly sweet flavors such as fruit and candy—decreased perceived product harm;25–28,38 and the availability of appealing flavors is associated with an increased willingness to try e-cigarettes, initiation of e-cigarettes, and susceptibility to cigarette smoking.24,25,28,52–54 Findings specific to adults are more varied, but demonstrate that non-menthol flavors in e-cigarettes increase appeal, enjoyment, and the price users are willing to pay for the product29–31,33–36 and are a primary reason many adults use e-cigarettes.34,41–45"

6) Page 25- paragraph 2- this paragraph seems out of scope of the rest of the paper, as it focuses on general tobacco control measures to curb youth e-cigarette use, not specifically on flavors. Consider cutting this section or making a closer connection between these policy initiatives and flavors.

Author response:

Thank you for pointing this out. We have chosen to delete the entire paragraph.

7) page 4- " ...7000 flavors existing" needs a supporting citation

Author response:

We have included a citation.

8) page 5 line 5-6 should be e-cigarettes rather than flavored tobacco products as this paper focuses on e-cigarettes only

Author response:

Thank you, we have updated.

Reviewer 2:

1) Introduction:

Since this systematic review also included articles from other countries other than the U.S., the authors may add a sentence of two to describe the prevalence and use patterns of flavored e-cigarettes in some other countries.

Author response:

We have included the following sentences in the Introduction: "Recent data suggest that 20.8% of US youth and 4.5% of US adults are current e-cigarette users. These numbers vary globally, with 5.9% of adults and 8.2% of adolescents in Poland but only 0.3% of adults in Indonesia reporting current use."

2) Since the authors were interested in only examining non-menthol flavors, in the methods section, the authors need to explicitly mention "flavors" as "non-menthol flavors" (menthol is still considered as a characterizing flavor in tobacco products so the authors need to be clear here). The authors may also need to further explain why menthol flavors are excluded from this systematic review (this can take place in the Introduction section or the methods section).

Author response:

We make sure to include the term non-menthol where applicable throughout the paper.

2) Additionally, the authors may need to explain why "tobacco" is not considered as a flavor in this scenario although e-liquid bottles and e-cigarette products often label "tobacco" as a flavor.

Author response:

Thank you for your comment. In the article we do not explicitly discuss tobacco as a flavor category or as it relates to the explored behavioral outcomes because it is often treated separately in both the literature and in policy implementation. We include the designation of tobacco flavor vs. non-tobacco flavor where appropriate according to what was presented in individual articles. For purposes of our review, we did not exclude tobacco flavored products. We have included the following sentence in the Methods section: "Additionally, because menthol and tobacco are often treated differently as it relates to policy implementation (e.g., in 2009, FDA banned characterizing flavors except for tobacco and menthol in cigarettes) and is also often viewed separately from other flavors in the literature, this review excludes articles that examine just menthol as a flavor."

To address the potential for banning menthol in cigarettes (as announced in FDA's 2018 Advance Notice of Proposed Rulemaking announcement), we have added the following sentence to the Discussion section: "Also of note in that same announcement is FDA's consideration of banning menthol in cigarettes, which would significantly impact the tobacco control landscape."

4) Methods:

More rationale is needed for excluding studies using qualitative research methods. Qualitative methods may be especially useful to understand the role of e-cigarette flavors in the perceptions of e-cigarette products among youth and young adults.

Author Response:

We include the following sentence on Page 5, lines 9-10 of the original submission: "In order to maintain a semblance of consistency across studies examined, we chose to exclude articles that used qualitative study designs."

And the following sentence in the Limitations section on page 25 and 26, lines 55-56 and line 4 respectively of the original submission: "Similarly, we excluded qualitative articles in order to maintain consistency in data reviewed, though we recognize that qualitative data could potentially provide important contextual information on this topic."

5) Although it is clear that this analysis tightly followed the methods of the first paper, it might be helpful to include the key search terms in the methods section again since this is an independent paper from the former one.

Author Response:

For this submission we included the original PubMed search string in a Footnote in the Methods section, and per Editorial Request moved them to a Supplementary File.

6) The authors need to further explain why QATSDD was chosen as a quality assessment tool since some readers might not be familiar with this tool.

Author response:

We include the following rationale in the "Quality Assessment" section of the Results, Page 24, lines 15-17: "Because the studies examined in this review use a variety of methodological approaches, the QATSDD tool was chosen as it was developed specifically for this purpose and has been shown to provide valid, reliable assessments of study quality."

7) For types of measures, it will be great if the authors can further explain why these specific outcomes were chosen. Were there any health behavior theory or tobacco use progression model that the authors used to form the selection of the outcomes?

Author response:

Thank you for your comment. We did not use behavioral theory or a tobacco use progression model. We used the outcomes reported by the authors and provided systematic organization and synthesis of the data. We have pointed out where additional outcome data are needed under conclusions: "...longitudinal studies of adult smokers are needed to assess the effect that e-cigarettes may have promoting or disrupting efforts to reduce or quit cigarette use".

8) Although the authors used PRISMA as a standard approach for systematic review, this method was not mentioned at all in the text of the methods section but only in the figure.

Author response:

To address this point, we include the following sentence in the Methods section, page 5, lines 37-38: "The study selection processes, which approximate but do not exactly follow the PRISMA methodology, are illustrated in Figure 1."

9) Results:

This may be a little too demanding and require more data coding and analysis, but this review can be largely improved by assessing the study findings by e-cigarette flavor types. The authors mentioned the specific flavors in some findings but not consistently throughout the results section. The authors may use Yingst article (Yingst, J. M., Veldheer, S., Hammett, E., Hrabovsky, S., & Foulds, J. (2017). A method for classifying user-reported electronic cigarette liquid flavors. *Nicotine & Tobacco Research*,

19(11), 1381-1385) to characterize e-cigarette flavors and group the flavors accordingly. This may be especially important given that existing articles used various methods of measuring flavors-- some grouped all the non-menthol flavors together and some separated them; some only examined individual flavors and some included all flavors. Doing so, this review may have the potential to inform flavored tobacco regulation-making (especially as some e-cigarette flavors may be particularly appealing and some other flavors useful for cigarette smoking cessation). Otherwise, the authors are encouraged to add a sentence or two in the discussion section about the variety of e-cigarette flavor categorization and how this inconsistency may create a problem to compare and contrast the study results (maybe also what future studies can do to overcome these challenges).

Author response:

Thank you for this suggestion. While we agree categorizing by e-cigarette liquid flavors would be helpful to policymakers, this is beyond the scope of what we are able to do in this manuscript. We have included the following in the Discussion section which we hope addresses this issue (page 25, lines 32-38 of original submission):

“Based on the results of this review, it is important to consider deficits in the literature that would assist policymakers in developing the most impactful regulations. For one, it is important to note that the literature does not have a consistent and standardized way to categorize flavors. Yingst and colleagues (2017) have attempted to identify such a classification system, which, if used by researchers, would allow results to be more easily compared across studies. This would also assist policymakers in regulating flavors more easily, as it is possible that some categories of flavors may be more appealing to youth than others.”

Discussion:

10) Again, the authors need to be clear that the “flavors” discussed here do not include menthol flavors.

Author response:

Thank you, we have updated the text to say non-menthol flavors where appropriate.

11) The authors expanded extensively on potential policy options of regulating flavored e-cigarettes; however, this is not a policy paper. The discussion section may be more relevant if the authors can deliberate how future studies can be improved to achieve higher research qualities based on the QATSDD tool. For example, not a lot of studies adopted a theoretical framework. The authors can provide the rationale of why providing such frameworks is important for understanding the role of e-cigarette flavors and which theories and models may be helpful. The authors can also recommend using PATH youth and adult surveys to assess longitudinal use of flavored e-cigarettes (and by flavor types) and outcomes since there is a lack of longitudinal studies.

Author response: We have included updated text in the Discussion section to address these concerns. Please see the following (page 25, lines 32-49 of original submission):

“Based on the results of this review, it is important to consider deficits in the literature that would assist policymakers in developing the most impactful regulations. For one, it is important to note that the literature does not have a consistent and standardized way to categorize flavors. Yingst and colleagues (2017) have attempted to identify such a classification system, which, if used by researchers, would allow results to be more easily compared across studies. This would also assist policymakers in regulating flavors more easily, as it is possible that some categories of flavors may be more appealing to youth than others. Similarly, because much of the research uses varying categories to examine age, it makes it difficult to disaggregate the effects flavors have on different age groups. Doing so would especially be helpful to policymakers who are trying to create regulations



that would have the most impact on youth initiation while maintaining the potential for adult harm reduction, though more research is needed to explore the latter. Furthermore, use of the QATSDD tool reveals deficits in the existing literature. Few studies provided evidence of sample size consideration or commented on the reliability or validity of their measurement tools. Reviewing these types of parameters before publishing may ensure that researchers are providing the most rigorous explanation of their research as possible. Finally, since so few longitudinal studies are present, it may be beneficial for researchers to use such data sets as PATH to show longitudinal trends in the outcomes presented in this review, in an effort to strengthen the existing body of literature with longitudinal data.”

12) Since this review included articles from countries all over the world, the authors need to be clear about the results in the Discussion section. The authors may link the results from other countries to the specific countries’ regulation progress on flavored e-cigarettes.

Author response: Thank you for your comment. We believe that further separating results by country, , will not add sufficiently at this time to overall findings but rather dilute the current findings. We have described countries of origins in descriptions of most studies. In addition, to bolster the Discussion section and to address this comment, we have added the following to the Discussion section: “It is also important to consider the context in which each of these studies was conducted; because this review included results from both US and global studies, policies may differ and individual cultural contexts around e-cigarette use may have affected the outcomes.”

13) Since this review is an update of a published review, the authors are encouraged to compare the results of these two reviews beyond only study numbers. What are the recent articles more likely to focus on compared to the old articles and what does this difference imply for the field of tobacco control research?

Author response:

We have added a paragraph to the Discussion to address this:

“This new review significantly expands earlier findings about e-cigarettes and flavor among youth and adults. The previous review showed initial evidence that flavors in e-cigarettes were primary reasons for willingness to try or use the products. This expanded systematic review includes emerging longitudinal data and adds evidence on the role of flavors in e-cigarettes among youth and adults. Among youth, flavors increase not only preferences for e-cigarettes, but they also increase e-cigarette product appeal, willingness to use, susceptibility to use, and initiation, as well as decrease e-cigarette product harm perceptions. Among adults, the expanded research now shows that e-cigarette flavors increase product appeal and enjoyment, and the availability of flavors are a primary reason for use for many adults. Further, our quality review process provides important insight for researchers in this field to improve the rigor of e-cigarette research and includes essential information on study sample size and the reliability or validity of measures.”

14) A more comprehensive view on the localities restricting the sale of flavored e-cigarettes can be found from this article: Chen, J. C., Green, K. M., Chen, J., Hoke, K. S., & Borzekowski, D. L. (2018). Restricting the Sale of Flavored E-cigarettes in the US: An Examination of Local Regulations. *Tobacco Regulatory Science*, 4(4), 32-40.

Author response:

Thank you for pointing out this useful citation. We include it in the discussion section in the following sentences (page 25, lines 6-12 of original submission):

“In the meantime, states and localities have the authority to restrict the sale of flavored tobacco products, including flavored e-cigarettes. A comprehensive review of flavored e-cigarette regulations from 2017 showed that at the time, over 100 localities had implemented restrictions on the sale of

flavored e-cigarettes. Movement has continued to be made on this topic since that review; for instance, San Francisco passed a measure to ban the sale of all flavored tobacco products, including e-cigarettes, in 2018.”

15) In Conclusions, the authors may also mention more research is needed to assess the harm (entice youth to vape) and benefits (help adults transition off cigarettes) of using flavored e-cigarettes.

Author response: Thank you for your comment. We feel as though the review makes it clear that non-menthol flavors in e-cigarettes entice youth to vape, and we also agree that more research is needed to provide evidence for the potential of non-menthol flavored e-cigarettes to assist in quitting smoking. Our conclusion made this distinction as follows:

“The increasing evidence among youth is clear: flavors in e-cigarettes (particularly sweet flavors) increase product appeal, decrease product harm perceptions, and increase willingness to use and initiation of e-cigarettes. Similarly, findings among adults demonstrate that flavors increase product appeal and enjoyment, and the availability of flavors are a primary reason for use for many adults. As the role of e-cigarettes in smoking cessation—and particularly how flavors impact this relationship—remains unclear, longitudinal studies of adult smokers are needed to assess the effect that e-cigarettes may have promoting or disrupting efforts to reduce or quit cigarette use. Regardless, findings are clear that banning flavors in e-cigarettes would discourage youth use of these products.”

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Deepa Camenga Yale University USA
<b>REVIEW RETURNED</b>	16-Aug-2019

<b>GENERAL COMMENTS</b>	<p>The authors have addressed the reviewers comments. Two concerns remain:</p> <p>The citation numbers listed in the References still do not align with the tables nor text. For example, Table 2, Amato 2015 is listed as citation 26. Citation 26 in the references on page 28 is listed as Pepper 2016. The track changes version does not show that the reference numbers have been updated.</p> <p>Given that tobacco flavor is included in this review, is to reword this sentence to make it more clear why tobacco is included and not menthol. A suggested sentence could be as follows:</p> <p>Additionally, because menthol and non-menthol flavors are often treated differently as it relates to policy implementation (e.g., in 2009, FDA did not include menthol in its cigarette characterizing flavor ban ) and menthol flavors are often viewed separately from other flavors in the literature, this review excludes articles that examine just menthol as a flavor.[22] We do include tobacco flavors because x.</p>
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<b>REVIEWER</b>	Julia Chen-Sankey NIMHD, US
<b>REVIEW RETURNED</b>	05-Aug-2019

<b>GENERAL COMMENTS</b>	The authors did a great job of addressing my comments.
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## VERSION 2 – AUTHOR RESPONSE

### Responses to Reviewers' Comments:

The citation numbers listed in the References still do not align with the tables nor text. For example, Table 2, Amato 2015 is listed as citation 26. Citation 26 in the references on page 28 is listed as Pepper 2016. The track changes version does not show that the reference numbers have been updated.

#### Author response:

Apologies for the confusion. Using citation management software makes it difficult to show track changes specifically for updating citations, but we have updated all citations and they are all now correct.

Given that tobacco flavor is included in this review, is to reword this sentence to make it more clear why tobacco is included and not menthol. A suggested sentence could be as follows:

Additionally, because menthol and non-menthol flavors are often treated differently as it relates to policy implementation (e.g., in 2009, FDA did not include menthol in its cigarette characterizing flavor ban ) and menthol flavors are often viewed separately from other flavors in the literature, this review excludes articles that examine just menthol as a flavor.[22] We do include tobacco flavors because x.

#### Author response:

We updated this sentence as follows: We do include tobacco in this review because despite the regulatory differences, some literature chooses to include tobacco as a characterizing flavor and we wanted to explore any potential relationships produced by the literature.