PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Young adult perceptions of JUUL and other pod electronic cigarette devices in California: a qualitative study
AUTHORS	Keamy-Minor, Emily; McQuoid, Julia; Ling, Pamela

VERSION 1 - REVIEW

REVIEWER	James F. Thrasher Department of Health Promotion, Education & Behavior Arnold School of Public Health University of South Carolina, Columbia USA
REVIEW RETURNED	08-Oct-2018

GENERAL COMMENTS	This qualitative study assesses user perceptions and behaviors around prefilled “pod” e-cigarettes, for which one brand – JUUL – has come to dominate the e-cigarette market in a very short time. Because of the rapid, recent emergence of this product type, little research has been conducted among users. For that reason, this qualitative research is potentially very useful in helping to understand the appeal of the product, particularly in contrast with other tobacco product types. This paper clearly describes the rationale for qualitative research, presenting results from thematic analysis of interviews of 10 young adult polyusers who have tried (n=3) or currently use (n=7) pod e-cigarettes. My primary concern is with regard to the small analytic sample, in which there are only 4 daily JUUL users (the product of greatest interest). I believe the authors could rectify this issue by integrating a more systematic comparison of this sample with others in their sample who use different e-cigarette device types (n=50 other polyusers not included in this analysis). For example, the results reference a few times when participants compared pod and “box type” e-cigarettes. Some of the perceptions highlighted seem like they would be similar (e.g., taste, smell, perceived health benefits, tech appeal, high nicotine dose, shorter consumption sessions), whereas others may be different (portability, discrete clouds). The authors make the case that social stigma is greater for box-type e-cigarettes than for pod devices, but do not provide evidence on this construct from box-type users, just those who have switched from box-types to pods. Why not systematically compare perceptions of pod users with those who use box or even more traditional rechargeable e-cigs (e.g., “cigalikes”)? A more systematic comparison of this type would make this a much stronger contribution to the literature and would help make up for concerns about the small sample size. Other comments are more minor:

	Methods Page 8, Data analysis. Was the codebook refined after one person read the transcripts? Or more than one? Page 9, lines 5-13: These two sentences do not add meaningful information. Suggest deleting. Results: Page 14, lines7-10. Here and elsewhere in the manuscript, the authors cite their previous manuscript. It seems unorthodox to provide the authors and title of this manuscript repeatedly. In most, if not all, instances, it should be integrated like other citations are (in this case, with a number). Page 16, lines 8-13: The authors bring up the issue of social media exposures, but do not provide any information on this issue. How would social media advertising for pods contribute to their differential use, relative to other e-cigarette types?

REVIEWER	Pallav Pokhrel Associate Professor, University of Hawaii Cancer, U.S.A.
REVIEW RETURNED	27-Oct-2018

GENERAL COMMENTS	This study has some obvious limitations related to sampling. Sample size is small and the number of subjects selected seems to not have been guided by any method. The data does not seem saturated. These limitations need to be adequately discussed. That said, the study is very timely and has significant new information to present. It makes several good points about why youth/young adults may use pod-based devices vs other devices. The findings clarify similarities and differences in expectancies by device type quite clearly. Overall, I think this is a well-written manuscript that adds to the existing knowledge about young adult e-cig use.

VERSION 1 – AUTHOR RESPONSE

Response to Reviewers

Thank you to the two reviewers for their constructive comments which we believe have greatly improved the paper.

The reviewers' comments were itemized. Reviewer 1's comments are found in the first table, Reviewer 2's comments are found in the second table. Page numbers refer to the final (track changes accepted) version of the document.

	Reviewer 1 Comments	Responses
1.1	Reviewer: 1 Reviewer Name: James F. Thrasher Institution and Country: Department of Health Promotion, Education & Behavior Arnold School of Public Health University of South Carolina, Columbia USA Please state any competing interests or state 'None declared': None declared. Please leave your comments for the authors below This qualitative study assesses user perceptions and behaviors around prefilled "pod" e-cigarettes, for which one brand – JUUL – has come to dominate the e-cigarette market in a very short time. Because of the rapid, recent emergence of this product type, little research has been conducted among users. For that reason, this qualitative research is potentially very useful in helping to understand the appeal of the product, particularly in contrast with other tobacco product types. This paper clearly describes the rationale for qualitative research, presenting results from thematic analysis of interviews of 10 young adult polyusers who have tried (n=3) or currently use (n=7) pod e-cigarettes. My primary concern is with regard to the small analytic sample, in which there are only 4 daily JUUL users (the product of greatest interest). I believe the authors could rectify this issue by integrating a more systematic comparison of this sample with others in their sample who use different e-cigarette device types (n=50 other polyusers not included in this analysis). For example, the results reference a few times when participants compared pod and "box type" e-cigarettes. Some of the perceptions highlighted seem like they would be similar (e.g., taste, smell, perceived health benefits, tech appeal, high nicotine dose, shorter consumption sessions), whereas others may be different (portability, discrete clouds). The authors make the case that social stigma is greater for box-type e-cigarettes than for pod devices, but do not provide evidence on this construct from box-type users, just those who have switched from box-types to pods. Why not systematically compare perceptions of pod users with those who use box or even more traditional rechargeable e-cigs (e.g., "cigalikes")? A more systematic comparison of this type would make this a much stronger contribution to the literature and would help make up for concerns about the small sample size.	We have followed the reviewer's suggestion to include analysis of transcripts from additional participants of the parent study who reported use of non-pod e-cigarette devices. This has increased the sample size from 10 to 24 participants. These additional participants' accounts have been used to compare and contrast the unique characteristics of pod devices reported originally in the transcripts, providing further insight into how participants' experiences with and uses of box mods, vape-pens, and other e-cigarettes contrast with pod devices. Please see Methods for explanation of transcript selection and analysis and participant characteristics from the new augmented sample for this paper. Our edits include the following starting on page 7: "Data Analysis The initial coding scheme included product types, product use routines, and product perceptions. The third author created the initial codebook after closely reading six transcripts and holding group discussions during data collection. The coding scheme was further refined in iterative team meetings with the first and second authors to accommodate emergent themes after the first 12 transcripts had been coded by the first author. The first author applied the final coding scheme to the rest of the transcripts. Transcripts were ranked in order of semantic richness. Excerpts from 18 of the richest transcripts regarding participants' e-cigarette use were read in tandem by the first and second author. From these in-depth readings, detailed memos regarding emerging categories of interest (e.g., characteristics of different e-cigarette devices) were made.(13) Four of these 18 transcripts contained pod device content. An additional 6 transcripts that had not been included in the tandem reading contained content regarding pod devices. These were also included in this analysis to supplement content on pod devices, for a total of 24 transcripts. Additional detailed memos were made by the first author describing and analyzing relevant pod device content from these excerpts, which were discussed with the second author. Saturation regarding e-cigarette use was reached after 24 transcripts. The third author performed an independent reading of pod device excerpts. All three authors discussed the memos and excerpts, identifying the following themes regarding unique characteristics of pod devices: sensory experience, health effects,

		aesthetic appeal, convenience, nicotine delivery, contexts of use, and social meanings. Participants This paper draws from 24 interviews with participants who were current e-cigarette users. Of the 24 interviews reported in this paper, 10 participants were current or former pod-device users and 14 were current non-pod e-cigarette users (e.g. small “cigalike” devices resembling cigarettes,, medium devices like ‘vape pens,’ and large ‘tank’ or ‘box mod’ devices). The study was designed prior to the popularization of pod devices, so did not specifically recruit pod device users or systematically assess pod devices in the interview guide. The 10 pod-device using participants were 18-28 years old and had used a pod device (JUUL or My Von Erl) in the past year. Seven still used a pod device at the time of the interview and, of these, 5 did so daily. Most current pod device users owned their device; the two non-daily users shared a friend’s device. Similar to national patterns of young adult smoking,(14, 15) nearly all pod-device using participants smoked cigarettes in the past month (n=9), but none were daily smokers (Table 1).” Please see Results for integration of additional participant quotes. A few examples of new quotes are included below: Comparison of convenience of pod devices versus non-pod e-cigarettes, page 15: “In contrast, lack of discretion was a significant concern for participants who used non-pod devices.. As Esther explained of her box mod: “I don’t want to be in public smoking these huge vapor clouds, but I know that I am going to get nicotine cravings.” (Esther)” Comparison of use contexts, page 16: “Compared to cigarettes, both non-pod and pod e-cigarette devices are easy to use indoors, as they are not perceived to leave a “lingering smell”. As Victoria explained: “You know if somebody has smoked a cigarette in a house. You know if it's been in a car. Even if it's been a while, there's that lingering smell. This [vape pen], it doesn't smell at all.” Comparison of social meanings, page 17:

		"John explained that he is less worried about generating second-hand smoke with his non-pod e-cigarette than with cigarettes: "I take into consideration when I smoke because I don't want to affect others' health. So, pretty much in public areas where there tends to be a lot of children, I don't smoke [cigarettes]. Whereas, with the vaporizer, I feel like I'm able to smoke [vape] anywhere."" Comparison of social meanings, page 17: "Ajay, who uses a vape pen and occasionally a box mod, provided a vivid description of the social disapprobation formerly associated with using non-pod e-cigarettes: "Like two years ago if you were out vaping we would just make fun of you the whole time we were smoking. And we'd just call you like you little sissy. Just smoke real cigarettes."
	Other comments are more minor: Methods Page 8, Data analysis. Was the codebook refined after one person read the transcripts? Or more than one?	We have clarified the process by which the initial codebook was refined. See page 7: "The third author created the codebook after closely reading six transcripts and holding group discussions during data collection. The coding scheme was further refined in iterative team meetings with the first and second authors to accommodate emergent themes after the first 12 transcripts had been coded by the first author. The first author applied the final coding scheme to the rest of the transcripts."
	Page 9, lines 5-13: These two sentences do not add meaningful information. Suggest deleting.	Identifying patient and public involvement in the study is a requirement of BMJ Open. The second sentence regarding dissemination of results has been deleted. The disclosure on page 9 now reads: "Research questions were informed by feedback from prior qualitative studies conducted with the target population of young adult tobacco users. Participants were not directly involved in the study design, recruitment, and conduct of the study."
	Results: Page 14, lines7-10. Here and elsewhere in the manuscript, the authors cite their previous manuscript. It seems unorthodox to provide the authors and title of this manuscript repeatedly. In most, if not all, instances, it should be integrated like other citations are (in this case, with a number).	This citation was cited differently because it referred to a manuscript that was still under review. Now that the paper has been published, we have integrated the citation in the same format as the other references.

	Page 16, lines 8-13: The authors bring up the issue of social media exposures, but do not provide any information on this issue. How would social media advertising for pods contribute to their differential use, relative to other e-cigarette types?	We have added discussion on the apparent influence of social media marketing of JUUL and other pod devices on the increasing popularity of these devices among youth and young adults (see page 19): "Some characteristics of pod devices may help explain their appeal to younger populations. Associations with friendly and ubiquitous personal electronic devices rather than deadly and stigmatized tobacco products may facilitate use by young people, including nonsmokers. These characteristics paired with social media advertising may encourage uptake among the young, particularly as social media content facilitates modeling and normalizes use. [3 4] A systematic review of JUUL marketing content from 2015-2018 on Twitter, Instagram, and YouTube (Huang et al. 2018) revealed an innovative, engaging, and wide-reaching campaign conducted by JUUL and its affiliated marketers on these social media platforms, with audiences that disproportionately consist of youth and young adults."
	Reviewer 2 Comments	Responses
2.1	Reviewer: 2 Reviewer Name: Pallav Pokhrel Institution and Country: Associate Professor, University of Hawaii Cancer, U.S.A. Please state any competing interests or state 'None declared': None declared Please leave your comments for the authors below This study has some obvious limitations related to sampling. Sample size is small and the number of subjects selected seems to not have been guided by any method. The data does not seem saturated. These limitations need to be adequately discussed. That said, the study is very timely and has significant new information to present. It makes several good points about why youth/young adults may use pod-based devices vs other devices. The findings clarify similarities and differences in expectancies by device type quite clearly. Overall, I think this is a well-written manuscript that adds to the existing knowledge about young adult e-cig use.	We have increased the sample size by including an additional 14 participants who used non-pod e-cigarettes (e.g., large tank devices, vapor pens, cigalikes), per reviewer 1's suggestion. We reached saturation on e-cigarette content by performing tandem reading of the 18 richest transcripts that contained content on e-cigarette use (not specifically pod devices) and supplementing pod device content by adding an additional 6 transcripts containing content on pod device use from the rest of the sample. The final sample now comprises 10 participants who use pod devices and 14 participants who used non-pod e-cigarettes. This has allowed us to draw comparisons between perceptions of pod devices and non-pod e-cigarettes within the sample. Please see methods for additional detail on the sampling methodology. This section has been expanded to address inclusion of the additional transcripts. We have further emphasized the limited number of pod device users in our sample within the bulleted limitations on page 4, and have expanded the limitations section in the discussion on page 20 to discuss the limits in representing pod device user experiences due to the small sample size. Limitations bullet points:

		• "Limited number of mostly male participants who use pod devices from a single geographic area • Study was of poly-tobacco users; participants who use pod e-cigarette devices were not purposively sampled" Beginning of limitations section, page 20: "This study did not specifically recruit pod device users, so the number of pod device using participants was small. Our pod device using participants were predominantly male. They could also be considered early adopters of pod devices, having begun use within the first two years after these products appeared on the market. The experiences of other young adults, particularly women and those who may be less prone to early adoption of new technology, may differ from the accounts presented here."