

PEER REVIEW HISTORY

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

ARTICLE DETAILS

TITLE (PROVISIONAL)	Eliciting preferences for waterpipe tobacco smoking using a discrete choice experiment: Implications for product regulation
AUTHORS	Salloum, Ramzi; Maziak, Wasim; Hammond, David; Nakkash, Rima; Islam, Farahnaz; Cheng, Xi; Thrasher, Jim

VERSION 1 - REVIEW

REVIEWER	Burton, Suzan University of Western Sydney, School of Business
REVIEW RETURNED	12-Jun-2015

GENERAL COMMENTS	<p>The factors that increase waterpipe consumption are important to understand, and this is a well-written paper. However I don't think the research design justifies some of the conclusions. It's quite possible that some of the characteristics of the choice design will have encouraged some results (e.g. a preference for flavoured varieties, since these dominated the choice design (three to 1) and in the absence of information about order of the scenarios presented, potentially including the first three options. In addition, the presentation of the 'none' option) (smaller font, right justified, no picture, presented last) is likely to have decreased attention to this option.</p> <p>For these findings to be robust, I would hope to see a much more rigorous design including random ordering of options, a choice scenario that is not dominated by flavoured varieties, and a non-choice option that does not appear to be dominated by the other options.</p> <p>In addition, the results from the choice scenario aren't at all surprising e.g. that young people prefer lower priced options, and that a sample with a large percentage of non-smokers prefers low-nicotine options, likes flavoured options, and is less likely to select anything if a very strong health warning is presented. Below, I identify a number of additional issues with the paper.</p> <p>Introduction 1. The literature review is somewhat confusing, with a statement that waterpipe smoking 'is largely unregulated' and another saying that 'current tobacco control policies are not clear about health warnings'. I suggest you pick one jurisdiction, and explain for that area, whether or not there is any relevant regulation.</p>
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	<p>2. Misleading and/or deceptive labelling would seem to be another matter entirely. I'm not sure what the point is by discussing examples of such labelling.</p> <p>3. The statement that flavour availability is a potential factor in attracting new smokers is uncited, but there is already evidence that flavoured varieties are very popular (e.g Smith-Simone et al 2008). Given that evidence, it's not clear what this paper adds by showing that flavors are attractive to some waterpipe users.</p> <p>Methods</p> <p>1. There is no discussion of the order of presentation of choice options. If the options were consistently presented as shown in Figure 1, this is likely to bias choice in favour of flavoured options (and away from non-choice) due to the order and emphasis of these options.</p> <p>2. It's not clear why several demographic features were included in the survey, but not analysed. This raises the suspicion that a variety of statistical tests were done, but only significant results were reported.</p> <p>Statistical analysis</p> <p>1. In Table 1, there appears to be no reference to HWLs, despite a footnote referring to the term.</p> <p>Results</p> <p>1. As discussed above, it's not at all surprising that participants preferred cheaper options, and were less likely to choose any if there was a strong health warning. Since flavoured varieties also dominated non-flavored varieties (in number, if not in order) it's also not surprising that flavored varieties were most preferred. It's also unsurprising that strong health warnings decreased choice.</p> <p>2. The statement that flavour dominated other choice attributes is fairly meaningless, because it will depend very much on the options presented for each choice variable. For example if the price options ranged from \$5 to \$50, price would become more important. So a statement about the relative importance of choice options is very specific to the exact choice scenario, and not generalizable to choice scenarios which are significantly different.</p> <p>3. Findings that non-smokers are more likely to prefer flavored varieties and non-nicotine options are very unsurprising. Does this tell us anything useful?</p> <p>4. The statement that flavored options and lower nicotine options increase demand can't be supported by the choice scenario. These options were preferred, but that doesn't mean that demand will automatically increase from these options (though logically, it's pretty obvious that it will, since increased options are only likely to increase demand).</p> <p>Discussion</p> <p>1. As reflected in my comments above, the suggestion that fruit flavors and low-nicotine options might possibly encourage non-smokers to use waterpipes is very logical, but since this study only examined people who reported having used waterpipes, the study</p>
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	<p>can't be used as evidence that such practices actually increase trial.</p> <p>2. As also discussed above, the suggestion that warning labels might decrease use of waterpipes isn't at all surprising. While the results were consistent with this result, the study didn't provide a rigorous test of warnings, so doesn't provide sufficient data in this area to justify publication.</p> <p>References</p> <p>1. The references are somewhat sloppy, with multiple errors and missing details (e.g. ref 12, and missing details for nearly all TC references). While this is easily fixed, lack of attention to references does suggest that the authors may have had a similar lack of attention to much more important aspects of the analysis.</p> <p>Figures</p> <p>1. Figure 2 is very hard to understand. The y axis isn't labelled, it isn't clear why data is presented in the form of two 'panels', the comparisons associated with the p values are unclear. In addition, p should not be reported as $p = 0.000$. Rather, it should be $p < 0.001$. This is a rather basic error, which suggests a lack of understanding of statistics, or a lack of attention to detail.</p>
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This manuscript received two reviews from its previous BMJ Journal but the other referee had declined to make his review public.

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Comments to the Author

The factors that increase waterpipe consumption are important to understand, and this is a well-written paper. However I don't think the research design justifies some of the conclusions. It's quite possible that some of the characteristics of the choice design will have encouraged some results (e.g. a preference for flavoured varieties, since these dominated the choice design (three to 1) and in the absence of information about order of the scenarios presented, potentially including the first three options. In addition, the presentation of the 'none' option (smaller font, right justified, no picture, presented last) is likely to have decreased attention to this option.

RESPONSE: An underlying assumption in choice experiments is that preferences are independent of the number of choices within each choice set. However, testing the validity of this assumption was outside of the scope of our study because it would have required testing multiple choice designs for the same experiment. Also, we found that the non-flavored option was consistently dominated by all 3 flavored options independently. Further, our design choice that included multiple flavored choice options along with the non-flavored option is a reflection of the range of options that a smoker may encounter in a waterpipe café menu. Our presentation of the 'none' option is typical of similar choice experiment applications.

For these findings to be robust, I would hope to see a much more rigorous design including random ordering of options, a choice scenario that is not dominated by flavoured varieties, and a non-choice option that does not appear to be dominated by the other options.

RESPONSE: Unfortunately, our study design did not include random ordering of options. It is conceivable that participants may have chosen a flavored option (vs. the non-flavored option)

because it was listed first within the choice set. We now acknowledge this as a study limitation in the manuscript (Discussion section, 6th paragraph).

In addition, the results from the choice scenario aren't at all surprising e.g. that young people prefer lower priced options, and that a sample with a large percentage of non-smokers prefers low-nicotine options, likes flavoured options, and is less likely to select anything if a very strong health warning is presented. Below, I identify a number of additional issues with the paper.

RESPONSE: The contribution of our paper is that it confirms what we know about waterpipe smoking from the limited information previously collected using surveys of knowledge, attitudes, and beliefs. The value in this research is to provide strong empirical evidence to inform health policy. The purpose of this paper was to use a Discrete Choice Experiment (DCE) to provide stronger evidence of the determinants of demand for waterpipe tobacco smoking, including the relative influence of these different characteristics on demand – which is something that prior research has not established. The DCE method has become a well-established tool for such application in health services research, including in tobacco control research. That our findings are not surprising, is in fact reassuring of the limited evidence that exists on waterpipe smoking and thus the relevance of this study

Introduction

1. The literature review is somewhat confusing, with a statement that waterpipe smoking 'is largely unregulated' and another saying that 'current tobacco control policies are not clear about health warnings'. I suggest you pick one jurisdiction, and explain for that area, whether or not there is any relevant regulation.

RESPONSE: The first statement refers to absence of waterpipe regulation in general, while the second highlights the fact that even when the waterpipe is included in regulation of health warnings, the recommendations are not evidence based and may not be effective. This distinction has now been further clarified in the Introduction sections, paragraphs 3 and 4.

2. Misleading and/or deceptive labelling would seem to be another matter entirely. I'm not sure what the point is by discussing examples of such labelling.

RESPONSE: Discussion of misleading or deceptive labeling in the Introduction was meant to set the stage for testing nicotine labeling in the choice experiment. Nicotine content was one of the important attributes that we tested on waterpipe menus. We clarified this further by referring to "waterpipe tobacco products" instead of "waterpipe tobacco packaging" and specifically singling out "waterpipe café menus" in this statement (Introduction section, 4th paragraph).

3. The statement that flavour availability is a potential factor in attracting new smokers is uncited, but there is already evidence that flavoured varieties are very popular (e.g Smith-Simone et al 2008). Given that evidence, it's not clear what this paper adds by showing that flavors are attractive to some waterpipe users.

RESPONSE: We added a reference to Smith-Simone et al. and clarified that while flavor availability has been identified as a potential factor in attracting new smokers, no empirical evidence exists that examines the influence of flavors on the demand for waterpipe tobacco smoking (Introduction section, 4th paragraph).

Methods

1. There is no discussion of the order of presentation of choice options. If the options were consistently presented as shown in Figure 1, this is likely to bias choice in favour of flavoured options (and away from non-choice) due to the order and emphasis of these options.

RESPONSE: Please refer to our response above (2nd point under general comments for Reviewer 1).

2. It's not clear why several demographic features were included in the survey, but not analysed. This

raises the suspicion that a variety of statistical tests were done, but only significant results were reported.

RESPONSE: Additional demographic variables not used in the regression models have now been dropped from Table 1. The interaction of these additional variables with our choice model was never tested because they were not part of our original hypothesis. Our aim was to test the interactions of gender and cigarette smoking status only with waterpipe smoking choices. To eliminate any confusion, we have elected to remove these additional variables from the descriptive table (Table 1).

Statistical analysis

1. In Table 1, there appears to be no reference to HWLs, despite a footnote referring to the term.

RESPONSE: This footnote has been removed from Table 1.

Results

1. As discussed above, it's not at all surprising that participants preferred cheaper options, and were less likely to choose any if there was a strong health warning. Since flavoured varieties also dominated non-flavored varieties (in number, if not in order) it's also not surprising that flavored varieties were most preferred. It's also unsurprising that strong health warnings decreased choice.

RESPONSE: We agree that our results are not surprising based on what we know from other tobacco products. However, to our knowledge, this is the first choice experiment to study the influence of these important domains simultaneously in waterpipe tobacco smoking. Further, these effects help confirm that participants attended to and used the "no choice" option in a way that would be expected.

2. The statement that flavour dominated other choice attributes is fairly meaningless, because it will depend very much on the options presented for each choice variable. For example if the price options ranged from \$5 to \$50, price would become more important. So a statement about the relative importance of choice options is very specific to the exact choice scenario, and not generalizable to choice scenarios which are significantly different.

RESPONSE: We agree that all results are interpreted within their context. As such, our careful selection of key attributes defining the alternatives and their different values (levels) was guided by the factors that are expected to affect respondents' choices, as well as those attributes that are policy relevant. While there are no hard and fast rules used to determine the attributes and levels presented to respondents in a DCE, "a good experiment is one that has a sufficiently rich set of attributes and choice contexts, together with enough variation in the attribute levels necessary to produce meaningful behavioral responses in the context of the strategies under study".*

* Ryan, M., Gerard, K., & Amaya-Amaya, M. (Eds.). (2007). Using discrete choice experiments to value health and health care (Vol. 11). Springer Science & Business Media.

3. Findings that non-smokers are more likely to prefer flavored varieties and non-nicotine options are very unsurprising. Does this tell us anything useful?

RESPONSE: This finding may not be surprising given what we know about the relationship between tobacco products and flavors in general. However, our study uses an established method (i.e, DCE) to provide evidence specific to waterpipe smoking showing the potential influence of flavors on non-smokers. Given that nicotine content in waterpipe tobacco is not regulated or validated/tested, this finding is very important because such non-nicotine options can be the path to addiction of the unsuspecting user. Also, this issue is relevant to current discussions about reducing nicotine levels in cigarettes. This may make tobacco more attractive to nonsmokers, although they and more established smokers will nevertheless be less likely to become addicted smokers. This is now added to the Discussion section, 4th paragraph.

4. The statement that flavored options and lower nicotine options increase demand can't be supported by the choice scenario. These options were preferred, but that doesn't mean that demand will automatically increase from these options (though logically, it's pretty obvious that it will, since increased options are only likely to increase demand).

RESPONSE: Our Discussion section (6th paragraph) already includes the following statement addressing this issue: "The selected tradeoffs were based on hypothetical scenarios and should be treated with caution because smokers may have indicated different preferences if actual waterpipe lounge menus had been presented to them, where the choices they made involved monetary exchange for and use of the product." Despite this general limitation that applies to all DCEs, this method is widely accepted for application in marketing research as well as health services and policy research.

Discussion

1. As reflected in my comments above, the suggestion that fruit flavors and low-nicotine options might possibly encourage non-smokers to use waterpipes is very logical, but since this study only examined people who reported having used waterpipes, the study can't be used as evidence that such practices actually increase trial.

RESPONSE: We have clarified this point further in our Discussion section – i.e., that findings are derived from ever smokers of waterpipe and that further research is needed to study potential trial among non-smokers. The Discussion section, 1st paragraph includes the following statement: "The results show that fruit-flavored tobacco and lower nicotine content labels, two strategies widely used by the industry, may increase the demand for waterpipe smoking among young adults who have tried waterpipe..." and the 7th paragraph in the Discussion section now includes the following statement "Further research is needed to study these domains in greater depth, potential trial among non-smokers, ..."

2. As also discussed above, the suggestion that warning labels might decrease use of waterpipes isn't at all surprising. While the results were consistent with this result, the study didn't provide a rigorous test of warnings, so doesn't provide sufficient data in this area to justify publication.

RESPONSE: A rigorous assessment of various health warnings was outside the scope of this study, since the focus was on testing the influence of multiple product attributes simultaneously. However, we feel that our finding that presence of a warning was significantly associated with a higher likelihood of choosing the opt-out option is important and the first of its kind with respect to waterpipe smoking.

References

1. The references are somewhat sloppy, with multiple errors and missing details (e.g. ref 12, and missing details for nearly all TC references). While this is easily fixed, lack of attention to references does suggest that the authors may have had a similar lack of attention to much more important aspects of the analysis.

RESPONSE: The references from Tobacco Control are for articles currently available in electronic form only. Therefore, article volume and issue numbers are not yet available for these references. We now provide DOI information for these articles.

Figures

1. Figure 2 is very hard to understand. The y axis isn't labelled, it isn't clear why data is presented in the form of two 'panels', the comparisons associated with the p values are unclear. In addition, p should not be reported as $p = 0.000$. Rather, it should be $p < 0.001$. This is a rather basic error, which suggests a lack of understanding of statistics, or a lack of attention to detail. RESPONSE: We have added a footnote further explaining the graphs in Figure 2. Reporting of p-values in this figure has

been corrected (i.e., $p = 0.000$ has been replaced with $p < 0.001$).