PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	A cross-sectional survey investigating the desensitisation of graphic health warning labels and their impact on smokers, non-smokers and COPD patients in a London cohort
AUTHORS	Ratneswaran, Culadeeban; Chisnall, Ben; Drakatos, Panagis; Sivakumar, Sukhanthan; Sivakumar, Bairavie; Barrecheguren, Miriam; Douiri, Abdel; Steier, Joerg

VERSION 1 - REVIEW

REVIEWER	Sophie Coronini-Cronberg Hon. Research Fellow, Imperial College, London Consultant in Public Health, Bupa
REVIEW RETURNED	26-Feb-2014

GENERAL COMMENTS	Smoking cessation/prevention interventions are an important health issue - esp. amongst specific groups such as COPD patients. The stated purpose of this paper is therefore acceptable and relevant. However, I have strong reservations about the methodology, including (but not limited to): - the title should make clear the type of study this is (cross sectional survey?) - no details of patient selection or consent protocols given. Given the selection bias plus study design (survey) generalisability is extremely low - not something the authors seem to acknowledge with statements such as, "The use of GHWL is an important and useful deterrent in the primary and secondary prevention of smoking". - the categorisation of smokers/non smokers/COPD patients is strange: COPD patients can fall into either of the two categories. A 2x2 table would have helped. However, within the smoking categories, definitions of 'non smokers' and also grades of smoking/non smoking e.g. never smokers vs. quitters; recent quitters vs. those who have quit 2 years ago. None of this is made clear and undermines the paper. - given the setting - a hospital outpatient clinic - plus the fact that semi-structured interviews were conducted, it was a wasted opportunity to present this as a quantitative study (what was the benefit of it being semi-structured?). A qualitative analysis with patients to explore their beliefs and attitudes, inc. to GHWL would have been much more appropriate and illuminating - the results are self-reported statements of intent (e.g. smokers stating that if they developed early signs of disease they would give

	up). This, sadly, does not mean they will, so the usefulness of this information per se is limited. - the tables - and results generally - would benefit from simplification. Where possible, graphic representations should be utilised to engage the reader - Although the standard of English is acceptable, I also feel the manuscript could have benefitted from strong editing to shorten it and really focus on the important points. The text does not seem to 'flow' fluently, but instead seems interrupted or 'sticky' in several places. - I can't seem to find any details on how this study was funded? I don't think the statistics really add anything here. As it stands, the methodology needs revising and reframing. Then, analysis methods (statistical or otherwise) can be considered and employed as appropriate. In summary, I think the primary objective of this work - investigating de-sensitisation to GHWL - is very interesting, though a different methodology would have been much more appropriate. Smoking cessation/prevention - esp. among particular groups such as COPD patients - is very important, so it is certainly a topical subject and definitely warrants investigation.

REVIEWER	Dr Judith McCool University of Auckland New Zealand
REVIEW RETURNED	05-Mar-2014

GENERAL COMMENTS	**GENERAL COMMENTS** This paper describes differential effects of GHWLs on a sample of non-smokers, smokers and patients with COPD from a London-based hospital sample. It achieves the first aim of assessing the impact of GHWLs on the three groups, identifying that non-smokers, followed by smokers were most likely to respond the labels as they were intended. Yet, among patients with COPD, they showed the least impact. The explanation for this effect was attributed to 'desensitization'. Blindness or the elevated risk of blindness was least likely to be associated with tobacco use, suggesting that this may be a useful approach to reinvigorate the messages embedded in GHWLs on cigarette packs. **INTRODUCTION** Although this is an interesting study and will add to the literature on this subject, the authors take a very light approach to setting up the rationale for this work. Smoking cessation at any stage is arguably beneficial, but why specifically focus on this group and what else characterizes COPD patients in terms of their tobacco use, other risk factors, including social determinants. This information may assist to explain why this group was distinctly ambivalent about GHWLs. In

	addition, there is a large body of literature on GHWLs design and impact among different population groups and this is not well described, even if included in the references. If kept succinct, this information would be valuable to support the rationale for the expectation of a different reading of these images among COPD patients. It would be useful also to note what other smokefree policies or interventions are also in place within the UK and in the hospital setting (if appropriate). **METHODS** Clear and well described, although was it necessary to have trained interviewers with medical backgrounds? Were there any medical related tests or knowledge required? Or, does this insinuate that these are well educated trainers? It is not clear. Statistical analyses were appropriate. Were examples of GHWLs shown to participants prior to or during the structured questionnaire? **RESULTS** It is interesting to note the gender differences across all groups for fear response – this is consistent with other literature on risk perceptions for other subject areas, including drowning risk, or risk of developing skin cancer? Table 2 is very busy and could be simplified. Is it possible to create a composite score for the measure of items 2 and 3? **DISCUSSION** Line one, the discussion should relate to your research findings up front rather than make a generic statement about knowledge of health risks – please modify this statement. The main finding here is the desensitization effect or response to the GHWLs by people with COPD. How do the authors define desensitization? Where has desensitization been identified in other populations, if at all, in respect to exposure to GHWLs. It would be helpful to cite other literature on this issue, and explain how it is expressed. Health psychology literature may be relevant here. Given that COPD participants were old, more likely to be male and are more likely to have a history of heavy smoking (measured variously), are we looking at desensitization or a 'don't care', ambivalence to the imagery included in the GWLS? The desensitization effect is a possible explanation for why COPD patients responded differently than the two other groups to the GHWLS. The findings regarding the novelty of blindness as a consequence or health risk of smoking is notable and, as suggested could be amplified for impact among high risk, vulnerable groups such as those with chronic tobacco related conditions. Page 16, what is a 'sensible use of GHWL"?

	Page 17 – why suggest advertising the financial benefits of quitting on cigarette packs – what is the basis for this suggestion, except it may be an incentive for quitting. The development of the GHWLs has a long and detailed history; many of the current images used have been specifically selected to elicit specific responses, and to appeal to different groups. These are then rotate to ensure that they do not become familiar or stale. Further qualitative work may add some depth and direction to these questions that have emerged in the discussion.

VERSION 1 – AUTHOR RESPONSE

Reviewer Name - Dr Judith McCool

This paper describes differential effects of GHWLs on a sample of non-smokers, smokers and patients with COPD from a London-based hospital sample. It achieves the first aim of assessing the impact of GHWLs on the three groups, identifying that non-smokers, followed by smokers were most likely to respond to the labels as they were intended. Yet, among patients with COPD, they showed the least impact. The explanation for this effect was attributed to 'desensitization'. Blindness or the elevated risk of blindness was least likely to be associated with tobacco use, suggesting that this may be a useful approach to reinvigorate the messages embedded in GHWLs on cigarette packs.

INTRODUCTION

1) Although this is an interesting study and will add to the literature on this subject, the authors take a very light approach to setting up the rationale for this work. Smoking cessation at any stage is arguably beneficial, but why specifically focus on this group and what else characterizes COPD patients in terms of their tobacco use, other risk factors, including social determinants. This information may assist to explain why this group was distinctly ambivalent about GHWLs. In addition, there is a large body of literature on GHWLs design and impact among different population groups and this is not well described, even if included in the references. If kept succinct, this information would be valuable to support the rationale for the expectation of a different reading of these images among COPD patients. It would be useful also to note what other smoke free policies or interventions are also in place within the UK and in the hospital setting (if appropriate).

Response:

Thank you for your comment. We have added the following statement and comment, including reference to the UK department of health's 6 part tobacco control plan and table, to the revised version of our manuscript:

Desensitisation to GHWL could have the greatest impact in patients with COPD because they are exposed long term to the efforts of public health campaigns. Indeed older smokers are also reported to demonstrate less interest in quitting smoking [1] and they more often attribute symptoms to the effect of ageing or a non-medical cause [2]. A reduced respiratory symptom attribution to smoking would lead to a reduced likelihood to quit [3]. COPD is also associated with a higher prevalence of depression, poor memory, decreased attention [4] and mild cognitive impairment [5, 6]. These factors may reduce the cognitive impact GHWL have on smoking cessation and warrant further investigation.

Despite all efforts and whilst the government supports a comprehensive tobacco plan (Table 1),[7] more than 21% of the UK population continue to smoke.[8]

Table 1: Government tobacco plan [7]

Table 1 Six-part tobacco control plan
1) Stopping promotion of tobacco
2) Making tobacco less affordable
3) Effective regulation of tobacco products
4) Helping tobacco users to quit
5) Reducing exposure to second hand smoke
6) Effective communications for tobacco control

METHODS

2) Clear and well described, although was it necessary to have trained interviewers with medical backgrounds? Were there any medical related tests or knowledge required? Or, does this insinuate that these are well-educated trainers? It is not clear. Statistical analyses were appropriate. Were examples of GHWLs shown to participants prior to or during the structured questionnaire?

Response:

Preliminary discussions with COPD patients suggested they were more likely to participate in research investigating their smoking behaviour if the interviewers were medically trained. 'Specially trained' was meant to account for the simple training that took place regularly to minimize investigator led bias at various points of the survey. We have removed the term 'specially', as the rest of the sentence explains the 'training' that took place.

The GHWLs were shown during the structured interview following questions to assess the knowledge about health risks and prior to assessment of the emotional response, depth of procession and impact of labels on smoking behavior (i.e. smoking 'intentions' as pointed out by the 2nd reviewer). We have explained this on page 7: 'Participants were then shown GHWL (n=10) followed by…'

RESULTS

3) It is interesting to note the gender differences across all groups for fear response – this is consistent with other literature on risk perceptions for other subject areas, including drowning risk, or risk of developing skin cancer? Table 2 is very busy and could be simplified. Is it possible to create a composite score for the measure of items 2 and 3?

Response:

Thank you. We have simplified table 2 and this is now split into table 3 and table 4 of the revised manuscript. Table 4, as suggested, contains a composite score of the previous items 2 and 3, and these individual data have been moved to an online supplement as table E3 and E4.

DISCUSSION

4) Line one, the discussion should relate to your research findings up front rather than make a generic statement about knowledge of health risks – please modify this statement. The main finding here is the desensitization effect or response to the GHWLs by people with COPD. How do the authors

define desensitization? Where has desensitization been identified in other populations, if at all, in respect to exposure to GHWLs. It would be helpful to cite other literature on this issue, and explain how it is expressed. Health psychology literature may be relevant here.

Response:

Thank you. We have modified the beginning of the discussion and focused more on the desensitisation effect of GHWL in the revised manuscript. We have added the following statement:

Patients with COPD exhibit a decreased response to Graphic Health Warning Labels, an effect that can be referred to as desensitisation, whilst non-smokers and smokers without airway disease responded better. The use of GHWL evoked an emotional response of fear and disgust in the majority of participants, particularly in non-smokers, in females and in younger participants.

Further, as suggested, we have defined desensitisation and included the below paragraph in the main body of the revised manuscript in the discussion section (paragraph 2):

The effect of desensitisation can be defined as a process where repeated exposure results in habituation of a cognitive, emotional and physiological response. Psychological research has shown that novel events are processed more extensively than common events [9, 10] and whilst some papers discuss desensitisation as a possible mechanism for a decreased impact of GHWL,[11, 12] it has largely been described in relation to graphic video game imagery and violence [13].

5) Given that COPD participants were old, more likely to be male and are more likely to have a history of heavy smoking (measured variously), are we looking at desensitisation or a 'don't care', ambivalence to the imagery included in the GHWLS? The desensitisation effect is a possible explanation for why COPD patients responded differently than the two other groups to the GHWLS.

Response:

Thank you for this point. We accept the point made and refer also to the other reviewer, Dr Coronini-Cronberg, and your point number 8 that qualitative data could have helped to differentiate this further. In order to address this comment we have included the below paragraph to the limitation section of the discussion:

Whilst desensitisation is one explanation for our findings, it is possible that COPD patients demonstrate an ambivalence towards risks to support their own self-esteem.[14] This would suppress anxiety associated with a fear of the consequences of smoking [15] and portray itself as a 'don't care' attitude. Leventhal [16] postulated that fear messages may lead to two competing processes, either a 'danger control' or, in the case of our COPD cohort, a 'fear control' response. Indeed where fear-based approaches have been used to reduce illicit drug rates, increased rates of drug abuse were described post intervention.[17] Further qualitative work will help understand these specific responses better.

6) The findings regarding the novelty of blindness as a consequence or health risk of smoking is notable and, as suggested could be amplified for impact among high risk, vulnerable groups such as those with chronic tobacco related conditions.

Response:

Thank you. We have emphasised this point in the discussion.

7 a) Page 16, what is a ‘sensible use of GHWL?

7 b) Page 17 – why suggest advertising the financial benefits of quitting on cigarette packs – what is the basis for this suggestion, except it may be an incentive for quitting.

Response:

This sentence has been amended for clarity (page 19): ‘A balance between the use of GHWL and the observed desensitisation effects need to be considered’.

In suggesting financial benefits we wanted to mention other motivational factors that may be used in public health campaigns to quit smoking. This was one factor brought up by participants during discussions. However in hindsight, this may not focus on the message of this manuscript and this paragraph has therefore been removed to improve and shorten the focus of the study. Instead we refer to the government’s six-point plan for tobacco control in the revised version of the manuscript.

8) The development of the GHWLs has a long and detailed history; many of the current images used have been specifically selected to elicit specific responses, and to appeal to different groups. These are then rotated to ensure that they do not become familiar or stale. Further qualitative work may add some depth and direction to these questions that have emerged in the discussion.

Response:

Thank you for your comment. We have discussed the need for further qualitative work in the limitation section and the conclusion of the revised manuscript.

Reviewer Name - Sophie Coronini-Cronberg

Smoking cessation/prevention interventions are an important health issue - esp. amongst specific groups such as COPD patients. The stated purpose of this paper is therefore acceptable and relevant. However, I have strong reservations about the methodology, including (but not limited to):

1) The title should make clear the type of study this is (cross sectional survey?)

Response:

Thank you, the title has now been changed to describe the study design:

‘A cross-sectional survey investigating the desensitisation of graphic health warning labels and their impact on smokers, non-smokers and COPD patients in a London cohort’

2) No details of patient selection or consent protocols given. Given the selection bias plus study design (survey) generalisability is extremely low - not something the authors seem to acknowledge with statements such as, "The use of GHWL is an important and useful deterrent in the primary and secondary prevention of smoking".

Response:

Thank you for your comment, this sentence has now been removed and patient selection and consent protocols are included in the revised version of the manuscript in the ‘patients and methods’ section.

Further, we have mentioned the limited generalisability within our limitations` section (page 20) and we have carefully checked the revised manuscript to ensure similar statements were not made.

3) The categorisation of smokers/non smokers/COPD patients is strange: COPD patients can fall into either of the two categories. A 2x2 table would have helped. However, within the smoking categories, definitions of 'non smokers' and also grades of smoking/non smoking e.g. never smokers vs. quitters; recent quitters vs. those who have quit 2 years ago. None of this is made clear and undermines the paper.

Response:

Thank you for your comment, we agree that smoking history is important when defining a heterogenous group such as patients with COPD. We have included a break-down of the data used for the analysis of COPD, non-COPD, non-smokers, never smokers and quitters within the newly provided online supplement. Reference to this has also been included in the limitations section of the revised version of the manuscript:

'The smoking history was variable between subjects in the COPD group, as it included current smokers and also non-smokers. This could have impacted on and limited our results with regard to the COPD group (see online supplement, Table E1).'

4) Given the setting - a hospital outpatient clinic - plus the fact that semi-structured interviews were conducted, it was a wasted opportunity to present this as a quantitative study (what was the benefit of it being semi-structured?). A qualitative analysis with patients to explore their beliefs and attitudes, inc. to GHWL would have been much more appropriate. and illuminating.

Response:

The reported survey was structured and we appreciate that the terms 'interview' and 'interviewer' could have been misleading. The purpose of the research was to guide the participant through the questionnaire and present the GHWL. In the revised version of the manuscript we have changed the wording to 'survey' and 'researcher' instead of 'interview' and 'interviewer'.

We agree with the point that qualitative analysis may add further important knowledge in this context and we have included this point in the limitations` section and the conclusion of the revised version of the manuscript.

(Please refer also to Dr McCool's comment number 5 regarding whether a 'don't care'/ ambivalent attitude may be another possible explanation for the effects observed.)

5) The results are self-reported statements of intent (e.g. smokers stating that if they developed early signs of disease they would give up). This, sadly, does not mean they will, so the usefulness of this information per se is limited.

Response:

Thank you for this point, we have included the following statement in the limitation section of the revised manuscript:

'In addition, although Hammond et al. [18] demonstrated that smoking cessation was related to high cognitive processing of labels, intention to quit smoking was investigated here rather than actual behaviour change. Future research may need to investigate the achieved rate of smoking cessation

following GHWL exposure; also, the link between intention and actual change of smoking behaviour'.

6) The tables - and results generally - would benefit from simplification. Where possible, graphic representations should be utilised to engage the reader.

Response:

Thank you for your recommendation. We have included graphical representations to the revised version of the manuscript in the form of bar charts. We agree with your point to simplify the tables, as did Dr McCool (see point 3), and we have amended table 2, including some data in a newly created online supplement.

7) Although the standard of English is acceptable, I also feel the manuscript could have benefitted from strong editing to shorten it and really focus on the important points. The text does not seem to 'flow' fluently, but instead seems interrupted or 'sticky' in several places.

Response:

Thank you for this point, we have carefully edited the revised version of the manuscript and we have made major changes and re-arranged large parts of the introduction, methods, results and, in particular, to the discussion section to improve legibility.

8) I can't seem to find any details on how this study was funded?

Response:

We have included a statement on the funding on page 23 of the revision:

The sponsor of the study was King's College London School of Medicine. There are no competing interests or additional external sources of funding in the undertaking of this project or production of the manuscript.

9) I don't think the statistics really add anything here. As it stands, the methodology needs revising and reframing. Then, analysis methods (statistical or otherwise) can be considered and employed as appropriate.

Response:

Thank you for your suggestion. We have made changes to the revised result section, as pointed out above. In addition, we have discussed the manuscript again with Dr Abdel Douiri (Senior Lecturer in Medical Statistics, King`s College London), to check the accuracy of the methods and statistical means used. We have revised parts of the methodology. Please also refer to comment 2 of Dr McCool. We have acknowledged in the limitations section that further qualitative research is required in order to further understand the impact and the limitations of GHWL.

10) In summary, I think the primary objective of this work - investigating de-sensitisation to GHWL - is very interesting, though a different methodology would have been much more appropriate. Smoking cessation/prevention - esp. among particular groups such as COPD patients - is very important, so it is certainly a topical subject and definitely warrants investigation.

Response:

Thank you for your comment. We have focused more on the desensitisation effect in the discussion of the revised manuscript. We also explain in more detail why this is relevant in COPD patients in the introduction of the revision. We have incorporated the critique and feedback regarding the methodology, and amended the manuscript accordingly. (Please also refer to our response to the methodology limitations in your points 3, 4, 5 and 9.)

References

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2. Stoller, E.P., Interpretations of Symptoms by Older People A Health Diary Study of Illness Behavior. Journal of Aging and Health, 1993. 5(1): p. 58-81.
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14. Arndt, J., J. Schimel, and J.L. Goldenberg, Death Can Be Good for Your Health: Fitness Intentions as a Proximal and Distal Defense Against Mortality Salience1. Journal of Applied Social Psychology, 2003. 33(8): p. 1726-1746.
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16. Leventhal, H., Findings and theory in the study of fear communications. Advances in experimental social psychology, 1970. 5: p. 119-186.
17. Hornik, R., et al., Effects of the national youth anti-drug media campaign on youths. American Journal of Public Health, 2008. 98(12): p. 2229.
18. Hammond, D., et al., Impact of the graphic Canadian warning labels on adult smoking behaviour. Tobacco Control, 2003. 12(4): p. 391-395.

VERSION 2 – REVIEW

REVIEWER	Judith McCool University of Auckland, New Zealand
REVIEW RETURNED	29-Apr-2014

GENERAL COMMENTS	As this is a second review, I have only a few comments to make. Most, not all, of m previous suggestions have been noted and responded to in the current draft. Nonetheless, there remain a few concern about full acceptance of this paper as it stands. The suggested changes are minor: Overuse of the word "whilst" throughout the paper. In some instances it was used when another word, such as 'although' may be more appropriate. Is it standard to use the terms "white" "Asian / Asian British" and Black / Black British" for demographic / ethicnity categorisation? From a New Zealand perspective, this seems to be rather crude, but may be a standard reference frame for the UK. The final sentance of the conclusion could be strengthened - the reference to researhc on thoughts and feelings is a little weak. Thoughts and feelings are important to investigate but in what respect and why, as a final wrap up statement would be ideal.

VERSION 2 – AUTHOR RESPONSE

Reviewer Name - Dr Judith McCool

As this is a second review, I have only a few comments to make. Most, not all, of my previous suggestions have been noted and responded to in the current draft. Nonetheless, there remain a few concerns about full acceptance of this paper as it stands. The suggested changes are minor:

INTRODUCTION

1) Overuse of the word "whilst" throughout the paper. In some instances it was used when another word, such as 'although' may be more appropriate.

Response 1:

Thank you for noticing this. We have carefully reviewed the revised manuscript and the word ‘whilst’ will only be used once in the latest version. We have re-submitted a ‘track changes’ version of the revision with the changes visible on the tracked copy.

2) Is it standard to use the terms "white" "Asian / Asian British" and Black / Black British" for demographic / ethnicity categorisation? From a New Zealand perspective, this seems to be rather crude, but may be a standard reference frame for the UK.

Response 2:

Thank you for your comment. These categorisations are in keeping with the Office for National

Statistics recommendations for England and Wales [1] and are regularly used by the NIHR and other official offices.

3) The final sentence of the conclusion could be strengthened - the reference to research on thoughts and feelings is a little weak. Thoughts and feelings are important to investigate but in what respect and why, as a final wrap up statement would be ideal.

Response 3:

We have elaborated on this point in the conclusion:

"…Further, the timing of exposure to specific GHWL messages needs to be considered to avoid desensitisation. Future qualitative research is required to explore thoughts and beliefs of chronic smokers and COPD patients, to understand any ambivalence towards smoking consequences and to explore underlying reasons. A more tailored approach will help to support effective primary and secondary prevention and smoking cessation interventions."

References

1) "Ethnic Group". Office for National Statistics. http://www.ons.gov.uk/ons/guide-method/measuring-equality/equality/ethnic-nat-identity-religion/ethnic-group/index.html#8 Date accessed. 2 May 2014.