Author's response to reviews

Title: Non-specific psychological distress, smoking status and smoking cessation: United States National Health Interview Survey 2005

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Author's response to reviews: see over
We would like to thank all four reviewers for their helpful and thoughtful comments on our paper. We have revised the manuscript in line with the reviewers' suggestions. We feel that the paper has been significantly improved thanks to the valuable feedback received from each of the reviewers. We have detailed below the specific changes that have been made to the manuscript in response to each of the individual points raised by the reviewers.

**Reviewer 1**

*Page 11 reports linear associations, but Table 3 appears to show some non-linearity as well. In particular, there is a drop from the K6 8-12 group to the K6 13-24 group. This needs to be tested.*

We have tested differences between the four categories of K6 scores. For both proportion wanting to quit smoking and proportion having tried to quit smoking, the proportions were significantly higher in each subsequent group compared with people with K6 scores in the range 0-2 (p < 0.001, p < 0.001, p = 0.044 for wanting to quit smoking, p < 0.001, p < 0.001, p = 0.003 for trying to quit smoking). We separately tested if the apparent drop between the K6 8-12 group and the K6 13-24 group was statistically significant. This difference did not reach statistical significance in either case (p = 0.100 for wanting to quit smoking, p = 0.082 for trying to quit smoking). We agree that the pattern of the data is not consistent with a linear increasing trend. We have modified the reporting of the results on page 11 to address this issue.

*On p.3 the sentence beginning “There is a strong association...” gives the rate of mental disorders in adults who smoke. However it needs to be followed by the comparison rate in non-smokers.*

The comparison rate in non-smokers is 15% and this has been added to the text on page 3.

*On p.5 the sentence beginning “While this scale...” does not make sense.*

This has been re-written as two separate sentences.

*On p.5 the sentence beginning “As some have argued...” is awkward and needs rephrasing.*

This sentence has been re-written.

*On p.8 it is not stated what the time base of the CIDI diagnoses was. This also needs to be made clear in Table 1.*

The time base of the CIDI (12 months) has been included on page 8 and in Table 1.

*On p.9 “chi-squared” should be “chi-square”.*

This has been fixed.

*P. 12 refers to “High levels ... were ... associated.” I think “Higher” would be more appropriate.*

This has been amended as suggested.

*Last line of p.17 “lead” should be “led”*

This has been fixed.

*In Table 5 “months” needs to be added after “7-24”.*
This has been fixed.

*In Table 5, the line of numbers alongside “Family income” needs to be on the next line with “Under $20,000”.*

This has been fixed.

*In Figure 2 “Years since onset” would be clearer as an axis label than “years”*

This has been amended as suggested.

*The null hypotheses would be clearer for the reader if phrased as aims of the study*

The null hypotheses have been phrased as aims of the study.

*There is a literature on neuroticism as a correlate of smoking that could be mentioned*

We have included an additional paragraph at the end of the discussion to consider the role of neuroticism in smoking behaviour, and have referred to some of this literature.

*The paper mainly uses “psychological distress” but occasionally uses “mental health distress”. The latter term should be removed.*

The terminology has been standardised and “mental health distress” has been removed.

**Reviewer 2**

*The terms “psychological distress”, “mental disorders” and “anxiety” and “depression” are used interchangeably throughout the paper.*

The wording used in the paper has been standardised with “psychological distress” used when referring to the K6 scale, and “anxiety” and “depression” only used when referring to these diagnoses from the CIDI. The term “mental health distress” has been removed from the paper.

*Suggestion: “It is less clear whether people with these mental disorders want to quit smoking ... at the same rate as people without such disorders”.*

This wording has been adopted as suggested.

*“With some find quitting” needs fixing.*

This mistake has been fixed.

*Sentence clarity suggestion “Further, evidence suggests that some people respond more strongly than others to ... the stigmatising of smoking behaviours, tobacco tax increases, and price controls on tobacco”*

The suggested wording has been adopted.

*Last sentence of first paragraph needs context link back to mental health topic.*

We have added an additional sentence to provide a context link back to the mental health topic.
Authors could give examples of “socio-demographic predictors” in first sentence of first paragraph and also in a) null hypothesis.

Examples of socio-demographic predictors have been included in both the first paragraph and the null hypothesis a).

Background - It would be useful to provide the overall number of the sample in the US and Australian survey rather than revealing these later in the paper

The overall sample sizes for both surveys are now given in the background section.

The Australian process that integrates with the US one isn’t noted in the abstract.

The abstract has been rewritten to note the contribution that the Australian data make to contextualizing the results from the US survey.

Was there any process of gaining approval for the use of the NHIS dataset from its custodians?

No. The NHIS confidentialised data files are made freely available to any interested researchers. This has been noted in the methods section.

It may be useful to explain in lay terms why 2 different time periods were used (12 months and 7-24 months)

In part this is due to the categories used in the NHIS, and in part because we require a longer duration to define a successful quit attempt than to define an unsuccessful one. This is now described in the methods section.

The authors need to make it really clear to the reader why and how they have used the Australian survey.

We have expanded this section to make clear that the Australian data has been included to address a perceived weakness of the K6 scale – that it’s “past 30 days” time frame could be identifying short-term distress as well as mental disorders of long duration.

Sentence suggestion: “A multivariate ... was fitted to these data”

The suggested wording has been adopted.

The discussion section would benefit from subheadings

Sub-headings have been added into the discussion section.

Paragraphs beginning “we found that ... “ and “people with mental illness ...” Here is another example of mixing non-specific psychological distress and mental illness.

The wording throughout the paper has been standardised.

There needs to be a reference to support the sentence on tobacco industry marketing at the bottom of this page. Examples of ‘promotional strategies’ would enhance understanding here too.

Three citations have been added to support the first sentence, and addition description and citations has been added regarding promotional strategies used.
In the paragraph beginning with “It is known that ...”, “The large proportion ... argues that ... “
the word argues seems odd here.

This sentence has been rewritten.

Conclusion – the final sentence needs to be stronger.

We have expanded the conclusion, strengthening this argument.

Table 1 p.29 The column for % doesn’t add up to 100% (99.9%).

Each of the figures in the table has been rounded to the nearest significant digit shown. There can
be slight discrepancies in summing the rounded figures. The unrounded data sum to 100%.

Reviewer 3

It is unclear which individuals were included in which analyses.

We agree that the paper did not make clear which analyses were conducted on the full NHIS
sample, which were performed on the population of smokers in the NHIS, and which were
performed on the specific subset of individuals who had tried to quit smoking recently, and
individuals who had recently successfully quit.

We have revised the methods section to make explicit which analyses were performed on which
groups, and clarified the description of Figure 1, to make clear which analyses in the paper were
performed using this specific subset of individuals. We have also indicated the applicable samples
in the table titles.

The authors also report analyses from an Australian national data set looking at the relation
between psychological distress and specific mental diagnoses. It is my assessment that these
analyses should be removed from the paper. Their inclusion distracts from the main point the
authors are making, there is already published evidence for the relation of the K6 to mental health
diagnoses, and establishing a link between distress and smoking in one data set and between
distress and specific diagnoses in another does not establish a relation between specific diagnoses
and smoking.

We agree that there is good published evidence for the relation between the K6 and mental health
diagnoses. The strong relationship between specific diagnoses and smoking has also been well
reported. We did not include the data from the Australian study to validate the K6 as a measure of
mental disorder – this is already well established. We included this data to address a perceived
specific weakness of the K6 scale that is not addressed in any other published report on the K6 scale
as far as we know. That is the likely duration of mental disorders or psychological distress in
people who are identified as having psychological distress using the K6. The K6 questions
specifically relate to the 30 days prior to the survey. Leaders in tobacco control policy in Australia
have recently argued that there is no need to address the issue of common mental disorders in
relation to tobacco control policy because the majority of these disorders are likely of short term
duration or just transient episodes of adverse life circumstances that have no impact on long term
addictive behaviours. The Australian data, which allow direct comparison of K6 scores with
clinical diagnoses and the duration of clinical disorders make clear that not only do most people
with high levels of psychological distress also have clinical diagnoses of mental disorders, most of
these disorders are of long-standing duration. These data are the first that we know that address a
specific weakness of the K6 measure in relation to smoking and other addictive behaviors – whether
or not the K6 identifies transient conditions or long standing disorders. As the data clearly show the overwhelming majority of mental disorders identified by the K6 are long standing, this information significantly strengthens the findings of the NHIS analysis, and addresses a major obstacle to translating these research findings into policy and practice. As such we feel strongly that this information should be included in the paper.

We recognise that the paper as originally submitted did not make it sufficiently clear why this analysis was done. We have re-written the relevant sections of the introduction, methods and results to clarify why this analysis was undertaken, and what it does and does not add to the existing literature on the validity of the K6.

The way the results are described in the discussion does not always match what is reported in the results. On p. 14 it states “we found that people with moderate and high levels of non-specific psychological distress were just as likely as anyone else to want to quit smoking”. In fact the results suggest they were more likely to want to quit.

We have added to the description of the results to make explicit that people with moderate and high levels of non-specific psychological distress were significantly more likely to want to quit smoking, and have added additional test statistics to further clarify this relationship. We have corrected the discussion.

The authors might want to consider and discuss the mood maintenance hypothesis.

We have expanded the background to include a discussion of the mood maintenance hypothesis as a mechanism for the association between higher smoking rates and lower quit rates in people with high levels of psychological distress.

The authors might consider describing their hypotheses in terms of their actual a priori predictions rather than simply stating the null hypotheses.

The hypotheses have been restated as suggested.

The authors might want to look at the HINTS studies.

We appreciate this helpful suggestion, and will examine these data for future work in this area.

Reviewer 4

There is considerable recent and relevant literature which the authors have not mentioned.

We thank the reviewer for bringing the recently published work of her team to our attention. We have included these citations in the discussion.

The important findings which the authors should highlight are those showing what the adults with mental issues used to quit smoking and their self-reported interest in quitting.

We agree that these findings are important and we have highlighted these issues in both the abstract and the discussion.

The K6 can be scored as a bivariable (the respondent either has SPD or he does not). I would recommend analyzing this bivariable to compare cessation behaviors and attitudes since this is traditionally how the K6 is used.
In some studies a cut-off of 13 or above on the K6 scale is used to define severe mental illness or serious psychological distress. This cut-off has been used in the US National Survey of Drug Use and Health (NSDUH) to estimate prevalence of severe mental disorder, although the form of the K6 in this study is different. Respondents are asked to report for the worst month over the last year rather than the last month. This yields a prevalence of over 10% compared with around 3% who score 13 or above on the K6 in the NHIS. This is a population that is likely to require specialist mental health services. While there is no doubt that this group have high rates of smoking and low rates of smoking cessation, they represent a small proportion of smokers overall. More common mental disorders, such as anxiety and depression, which are strongly correlated with the K6, are also associated with high rates of smoking and low rates of smoking cessation. We have split the K6 into four categories with the highest category being 13 and above, corresponding to the definition of SPD used in the NHIS. However, we also found that each other category of K6 score had higher rates of current smoking and lower odds of smoking cessation compared with people in the lowest category. We believe that this is also an important finding with implications for tobacco control, as the proportions of the population in these intermediate K6 categories are substantial, and many of these people would not be in contact with specialist mental health services. This requires alternative, non-service based, approaches. We have expanded the discussion to address these issues.

The results section is clearly missing statistics and numbers which should be inserted throughout.

We are unsure which statistics or numbers the reviewer felt had been omitted from the results section. We have added in as many numbers and statistics as we feel are appropriate. In writing this section we had been mindful not to unnecessarily duplicate numbers in the text that already appear in the tables.

There appears to be a grammar mistake in line 4 of page 3 “With some find quitting smoking”

This error has been corrected.

p.4 rephrase “where mental disorders have been associated with less successful smoking cessation” rather than “lower”.

This sentence has been rephrased as suggested.

There are no footnotes for the tables or figures which are necessary to interpret these independent of the text.

We have clarified the titles of the tables and figures, and added footnotes where we felt this would be helpful. We are unsure what additional information the reviewer feels is necessary to interpret these tables and figures.

Table 1 is rather confusing in its current state. I would recommend removing the third column since it distracts from the comparison on NHIS to NSMHWB

The third column from Table 1 has been separated out into a new table, now Table 2.

This paper adds international comparison data that validate the use of the K6 in national surveys. This should be mentioned at some point as it is a strength of the paper.

We have incorporated this point into the abstract and the discussion.