Reviewer’s report

Title: Misconduct in research: A descriptive survey of attitudes, perceptions and associated factors in a developing country

Version: 1 Date: 24 May 2013

Reviewer: Zubin Master

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Comments to Authors:

The paper is a continuation of a study by the authors which aims to survey the attitudes of Nigerians on scientific misconduct. This is an excellent article that I suspect will be well received. It is important to understand the prevalence of misconduct and the perceptions of researchers in developing nations. I have listed most of my comments as major compulsory revisions in the order they appear in the manuscript, however I think the authors can use their discretion when responding.

Major Compulsory Revisions

1) Background section: As this paper will be open access and I suspect it will be highly accessed especially by researchers in developing countries, it would be good if the authors include a bit more information about research misbehaviors/misconduct and the Nigerian governance system of research integrity in the Background section. The authors quickly jump to the problem statement of their research study and why it is important to understand what is going on and what are the perceptions of researchers in developing nations. I will use the term “research misconduct” broadly here as the authors have defined it and not restrict it to falsification, fabrication and plagiarism. I provide two suggestions where the Background section can be expanded. First, could the authors discuss some of the data we have on developing countries as it pertains to the prevalence of misconduct? The authors briefly discuss one main result from their Developing World Bioethics (DWB) paper, but perhaps more can be discussed from this study e.g., 68.9% of Nigerian researchers admitted to having committed which of the 8 listed forms of misconduct. In addition, a recent article published by Ana et al. titled “Research Misconduct in Low and Middle Income Countries” in PLOS Medicine may be a good place to add some prevalence data from low and middle income countries. Second, if the authors could briefly describe the research integrity governance system in Nigeria (or the lack thereof) and situate how this fairs with developed nations i.e., the ORI or other systems in developed nations, this might provide the reader with a better understanding of how research integrity is governed in Nigeria. I think a few brief sentences should provide a greater understanding of the prevalence of research misconduct in developing countries and the system of governance of research integrity in Nigeria compared to other developed nations.
2) Background section: The paper is a continuation of the research performed based on the SMQ-R-based survey first published in the author’s DVB paper. In the last paragraph of the Background section, the authors state that the current study is the “concluding part of a larger study [5]”. Stating that the current study is a concluding part of a larger study does not clearly explain what parts of the SMQ-R-based survey were covered in the DWB paper and what is covered in the current paper. I think it would be clearer to the reader if in this last paragraph of the Background section the authors could clearly state the method used (SMQ-R survey) and what aspects (areas) of the survey were covered in the DWB paper and what will be covered here.

3) Methods section: Several parts of the methods need to be made clearer. A rationale for using the SMQ-R-based should be explained. The authors explain that their survey was adapted from the SMQ-R. What modifications were made and why? Lastly, if possible, the authors should place a copy of their survey as supplemental material. This last part is essential if anyone wishes to employ this instrument to survey other nations or to reproduce this work at a later date.

4) Methods section: The authors should indicate the number of questions per area that were in the survey.

5) Methods section: The authors explain in their DWB paper that performing a survey at the 2010 conference was a convenience sample. Yet other than in the Abstract, there is no mention of how the survey was disseminated. Moreover, what is the title of the 2010 conference and why was this conference chosen as a convenience sample should be stated in the Methods. Lastly, I presume the authors did receive permission from the conference organizers, as such I would explain this in the Methods.

6) Methods section: There are inconsistencies in the order and naming of descriptions in the Methods and the subsequent Results. (i) The authors explain that the questionnaire elicited information in four areas. But the order of the topics 1 through 4 is not in the same order in the Results section. For example, the fourth subsection on ethical climate of the work environment in the Results is listed as #3 in the Methods. (ii) The description in the Methods section should ideally have the same (or very similar) titles of the subsections in the Results section. (iii) Somewhere in the Methods section, the authors should discern what sections of the modified SMQ-R were covered in the DWB paper and what was covered in the current manuscript.

7) Results section: I have two suggestions: (i) If the authors could move the second paragraph making it the first paragraph of the Results section, this will clearly explain to readers what results are being presented in the current manuscript and what was presented in the DWB paper. (ii) The first paragraph of the results explaining the demographics has been previously published in DWB and reiterated here. I agree with the authors that it is necessary to reiterate the demographic information in the current manuscript. In order to be transparent, my suggestion is for the authors to state clearly that the demographic and
respondent information was previously obtained and published in DWB and is presented again here for ease for the reader. I think this is necessary to explain because the authors don’t want to make it appear as if these are original results presented for the first time.

8) Results section: I am not a statistical expert, but was there no statistical analysis performed for the nominal data showing differences in what participants reported? From my understanding, some form of statistics i.e., a Chi Square analysis would be appropriate to determine whether the observed counts fits expected ratios. If the Fisher exact test is meant to do the job I am explaining, why are the Fisher scores and p values not reported throughout the results and only the frequencies are reported. Does this mean other than what is reported in Table IV everything is statistically significant. If so my suggestion is to report these values alongside reporting the frequency data.

9) Results section: I would try and be consistent in explaining data throughout the Results section. (i) Within the text of the Results section, the authors began by reporting the number of participants followed by the percentage. Yet throughout the Results section, there are times when only the percentages are written, but the number of participants is not written. I would maintain consistency when reporting the frequency data to the best the authors can do. (ii) If the authors are explaining percentages with one decimal value, I would also keep this consistent throughout the text and tables. (iii) The language used in the text and in the tables is inconsistent. E.g., in the subsection “Attitudes and beliefs about scientific misconduct,” the authors explain the first result where researchers disagreed with the statement “dishonesty and misrepresentation of data are common in society and do not really hurt anybody” whereas in Table I this is written as “Dishonesty and misrepresentation of data is common in society and doesn’t really hurt anybody”. Just tiny word changes like “is” to “are” and a space between “anybody” should be made consistent between what is reported in the text and in Tables. (iv) Table 1 doesn’t have an explanation of the * and the column is labeled “Total no of resp.” whereas Tables II and III have the column labeled “*No of resp. to question”. Other column name differences exist in the Non-Respondent column. Again, I would make these titles consistent between columns in the tables where appropriate.

10) Results section: In the last paragraph of the Results for Table IV, it would be helpful if the authors could include a more substantive explanation of the results in the text despite the lack of statistical significance.

Discretionary Revisions

11) Results section: First sentence, first paragraph, it would be helpful if the authors could write “completed the survey” in “(133 out of 15 researchers attending the conference completed the survey)”.

12) Discussion section: First sentence, first paragraph, the word “his” should be “this” to read “The most pertinent finding from this study…”
13) Discussion section: In the last paragraph of the Discussion on the limitations of the study, I would like the authors to clarify their first limitation. The authors explain that their definition of scientific misconduct is wider than FFP used in US regulations. The definition of scientific misconduct as stated in the Methods section is “The non-adherence to rules, regulations, guidelines, and commonly accepted professional codes or norms”. This definition I think is so broad, it can capture anything. E.g., even verbal or sexual harassment can be captured which could be part and parcel of scientific misconduct, but it has more to do with professional misconduct than scientific misconduct. Because of this very broad definition, I think the authors might wish to explain that the high rate of prevalence of misconduct seen in their study, especially around falsification and plagiarism, might be partially explained by this very broad definition.

14) Discussion section: Also in the limitations paragraph, can the authors briefly mention that there is a self-reporting bias as it relates to misconduct in the workplace. People are likely to point fingers at others, but underreport their own unethical acts. This too I believe can partially explain the high frequencies of misconduct reported in the study.

15) A personal thing I like to do but of course it is up to the authors is to Acknowledge and thank the participants who took the time to complete the survey.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.