

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Women's Autonomy and Utilisation of Maternal Healthcare Services in 31 Sub-Saharan African Countries: Results from the Demographic and Health Surveys, 2010-2016
AUTHORS	Chol, Chol; Negin, Joel; Agho, Kingsley; Cumming, Robert

VERSION 1 – REVIEW

REVIEWER	Dr. Tulsi Ram Bhandari Faculty of Health Sciences, Pokhara University, Nepal
REVIEW RETURNED	15-Jun-2018

GENERAL COMMENTS	<p>Reviewer's report</p> <p>Title: Women's Autonomy concerning Utilisation of Maternal Health Services in 31 sub-Saharan African Countries: Results from Demographic and Health Surveys, 2010-2016</p> <p>Running title: No. Modified suggested title: No. Modified running title Women's Autonomy and Utilisation of Maternal Health Care Services in 31 Sub-Saharan African Countries: Results from Demographic and Health Surveys, 2010-2016</p> <p>Version: 1 Reviewer's report: 1. Is the question posed by the authors new and well defined? Yes, it is new. 2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work? Yes. 3. Are the data sounds and well controlled? Yes. 4. Does the manuscript adhere to the relevant standards for reporting and data deposition? Yes. 5. Are the discussion and conclusions well balanced and adequately supported by the data? Partially</p>
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	<p>6. Do the title and abstract accurately convey what has been found? Need to modify.</p> <p>7. Is the writing acceptable? Yes, acceptable, hence, it needs intensive editing before publication.</p> <p>8. Major compulsory revisions</p> <ul style="list-style-type: none"> • Title <ul style="list-style-type: none"> o I have suggested for modification. • Keywords <ul style="list-style-type: none"> o ... • Abstract <ul style="list-style-type: none"> o Rewrite the objective as per modified title. <p>To examine the association between women's autonomy and utilisation of maternal health care services across 31 Sub-Saharan African (SSA) countries.</p> <ul style="list-style-type: none"> o Write multilevel logistic regression instead of regression (line 18) and write consistently in the remaining text as well. o Change and accordingly- <ul style="list-style-type: none"> - 'Health services' have to replace by 'health care services' in the title as well as whole text. - Write 'outcome measures' instead of 'outcome'. - Is it possible? Would you check once again? (Odds ratio and CI in line 39-40) - The odds ratio has be reported as follows- (OR =..., 95% CI = ... - ...) o Rewrite the conclusion considering confounder's effect. - It is poorly supported by results. The results showed that the poor or marginalized relation between autonomy and utilization, hence, how could you recommend it? - There may be confounder effect in the low utilization of maternal health care services. e. g. education, economic conditions etc. - It needs further analysis considering confounder effect. - I suggest authors remove the further research recommendation from abstract and keep in the main text. - The conclusion has to be rewritten considering confounder effect why the utilization of maternal health care services is low in SSA? • Limitations <ul style="list-style-type: none"> o Explain, how the cross-sectional studies could lead to underestimation or overestimation of the association (page 3, line 12 ...). • Introduction <ul style="list-style-type: none"> o State the problem globally and continent-wide precisely. o State your research question precisely why it is interesting to write this article? o Remove or keep in methods with revision the following statement- 'we use the term autonomy to refer to empowerment' o Use logistic and multiple logistic regression instead of the terms-univariate and multivariate. (page-6, lines-49-50) • Methods <ul style="list-style-type: none"> o The flowing sentence seems odd and confusing; hence, it has to be specified or removed.
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	<ul style="list-style-type: none"> o I suggest authors for removing the following both sentences and describe sampling methods briefly in separate heading. Details of the sampling methods used in the DHS are described elsewhere. The results are released in publicly available DHS household datasets. o Study variable- 4 ANC visits, for ANC visit time is crucial. Would you specify recommended times of 4 ANC visits? If not, mention as the limitation of the study. o Cite and make reference in details of your analysis software/s. <ul style="list-style-type: none"> • Results o In the first part of your result present your major findings. o Do not repeat the same information in the table, figure and text. o First, perform descriptive analysis (univariate and bivariate) in details and apply multivariate analysis among selected variables... o Make simple table including limited information... o Authors only performed univariate analysis of confounder factors; for assessing the association there has to be performed multivariate analysis. But they performed bivariate analysis considering women's autonomy only. o I suggest authors apply multivariate analysis for assessing the confounder's effect on the utilization of maternal health care services. o Use a standard format to report the results of the statistical tests. <ul style="list-style-type: none"> • Discussion and Conclusion o In the first paragraph of the discussion, there has to discuss the major finding of the analysis briefly. o Remove following sentence or keep in introduction and method section with breaking down. Relevant to the current debate on how SSA will achieve the SDG-3 target by 2030, this study examined the association between women's autonomy and usage of maternal health services across 31 SSA countries. In the pooled results for all 31 countries combined there were only weak, albeit statistically significant, associations between women's autonomy and utilisation of maternal health services. o Reorganize/ rewrite your discussion and conclusion considering your revision of methods and results sections. <p>9. Minor essential revisions</p> <ul style="list-style-type: none"> o Flow authors guideline strictly. o Do not repeat the same information in the table, figure and text. o Use full-form of word/s before using the abbreviation. o Cite each table and figure in the text clearly. o Use simple past tense in the manuscript. o It needs language editing before re-submission. o Use only required statistics; present and interpret precisely. <p>10. Level of interest:</p> <ul style="list-style-type: none"> o Interesting in its field... <p>11. Quality of written English</p>
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	<ul style="list-style-type: none"> o Acceptable, however, requires extensive review before publication. 12. Statistical review o Require... 13. Conflict of interest o I declare no potential conflicts of interest.
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REVIEWER	Dr Sialubanje Cephas Ministry of Health, Monze District MedicalOffice
REVIEW RETURNED	10-Sep-2018

GENERAL COMMENTS	<p>Abstract Results Results reported in the abstract don't reflect those reported in the results section of the main document The abstract should summarise the major findings; let the authors summarise the findings by reporting the pooled results</p> <p>Conclusion In the conclusion (line 45), the authors state that "therefore, further research is needed in SSA to understand better why associations are weaker than in other parts of the world".... Yet in the findings no mention is made about associations in other parts of the world. Let the authors clarify this..</p> <p>Introduction Line 12 page ...write MMR in full before using abbreviations Line 17 and 18...."Increased utilisation of antenatal care (ANC) and skilled birth attendants (SBA) could help reduce the high maternal deaths on the continent"... Could the authors briefly summarise the main documented causes of maternal deaths before you suggest solutions Line 38....The authors state that "Most of the studies that have examined the relationship between women's autonomy and women's health were conducted in South and South-east Asia" I suppose that quite a lot of research has been conducted in SSA in this area, for example Sialubanje et al(2015).</p> <p>Study selection Line 27....Malawi and Zambia are in central Africa, and not eastern Africa Line 30....We restricted our analysis to the most recent child born in 5 years preceding each survey. Let the authors give reasons for this restriction.... Line 39: there are two outcomes provided...let the authors state which outcome is primary and which one is secondary.. Line 41 SBA write it in full before using abbreviations Line 10 to 25....There seems to be overlap between the items that measure the two constructs: attitude towards sexual violence and attitude to domestic violence (they both include this item: if beating a wife by a husband for refusing sexual intercourse with him is acceptable) Page 7...There seems to be a methodological error. On page 6 you mention that you adjusted for 5 potential confounders....but on page 7 you report that these potential confounders were entered in models 1 and 2... this is not correct.</p>
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	<p>Model 1 should have the independent or explanatory variables entered first from which you report the non adjusted odds ratio (OR).</p> <p>If you think there is confounding as mentioned on page 6, you then control for these potential confounders by progressively entering them into the next stage, model 2 and 3..after this you derive and report the adjusted odds ratio (AOR).</p> <p>If you think there is confounding as mentioned on page 6, you then control for these potential confounders by progressively entering them into the next stage, model 2 and 3..after this you derive and report the adjusted odds ratio (AOR).</p> <p>Table 1 Some percentages are not adding up to 100.Please check and correct</p> <p>Results Page 38...there seems to be a problem in the labeling of the figures. Three of the figures are labeled figure 1.... With different content... this is confusing. Figure 2 and figure 3 are missing...</p> <p>In addition, in all the figures (1-8), the pooled OR should read pooled AOR since you have adjusted for potential confounders</p> <p>In the results section, let the authors summarise the main results by providing the adjusted odds ratios (AOR) and then comment on some (a few country level data as follows:</p> <ol style="list-style-type: none"> 1. The association between women autonomy (opposing domestic violence) and utilisation of ≥ 4 ANC visits in 31 sub-Saharan African countries, 2010-2016 (AOR=1.01 (0.88-1.16)) 2. The association between women autonomy (decisions making on spending of household income) and utilisation of ≥ 4 ANC visits in 31 sub-Saharan African countries, 2010-2016 (AOR=1.25 (1.07-1.46)) 3. The association between women autonomy (decision making on major household purchases) and utilisation of ≥ 4 ANC visits in 31 sub-Saharan African countries, 2010-2016 (AOR=1.11 (1.08-1.14)). 4. The association between women autonomy in opposing sexual violence and utilisation of ≥ 4 ANC visits in 31 sub-Saharan African countries, 2010-2016 (AOR=1.09 (0.91-1.32)) 5. The association between women autonomy (opposing domestic violence) and utilisation of SBAs in 31 sub-Saharan African countries, 2010-2016 (AOR=1.12 (1.09-1.16)) 6. The association between women autonomy (decisions making on spending of
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	<p>household income) and utilisation of SBAs in 31 sub-Saharan African countries, 2010-2016 (AOR=1.15 (1.11-1.19)).</p> <p>7. The association between women autonomy (decision making on major household purchases) and utilisation of SBAs in 31 sub-Saharan African countries, 2010-2016 (AOR=1.08 (1.05-1.12))</p> <p>8. The association between women autonomy (opposing sexual violence) and utilisation of SBAs in 31 sub-Saharan African countries, 2010-2016 (AOR=1.15 (1.11-1.20)).</p> <p>Could the authors also assess the association between utilisation ANC and utilisation of SBA? And comment on this relationship in their discussion</p> <p>Discussion</p> <p>Page 13 line 20 -28 this is a limitation of the study. Remove it and take it to the limitation section</p> <p>Page 13... “Education has been shown to be associated with utilisation of maternal health services”. You controlled for this potential confounder in your analysis....so it does not come in. Discuss your results and possible reasons for this weak association</p> <p>Page 14...line 14...” One unexpected finding in our study is that women with higher autonomywere less likely to utilise either ≥4 ANC or SBA”. Discuss this finding in more detail and provide possible reasons for this inverse relationship.</p> <p>Page 14...line 32-56 the limitation section needs to be re-done. Comment on why you found these unexpected findings; for example quality of the data used; methodological issues,etc</p> <p>Conclusion</p> <p>The conclusion needs to be refined. You could include the following</p> <ol style="list-style-type: none"> 1) Comment on the overall goal of the study... 2) Is association between autonomy and service utilisation or not? 1) What are the recommendations for policy, practice and future research directions
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1’s comments in report and authors’ responses

<p>Please state any competing interests or state ‘None declared’: I declare no potential conflicts of interest</p>	<p><i>“The authors have no competing interests to declare”</i> Page 20 line 119.</p>
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Reviewer 1's comments in pdf and authors' responses

Reviewer 1	Author's responses
Title	
Modified running title	The title has been changed to: " <i>Women's Autonomy and Utilisation of Maternal Healthcare Services in 31 Sub-Saharan African Countries: Results from Demographic and Health Surveys, 2010-2016</i> "
Major compulsory revisions • Title: I have suggested for modification.	See above
Abstract	
Rewrite the objective as per modified title. To examine the association between women's autonomy and utilisation of maternal health care services across 31 SSA countries.	Corrected.
I suggest authors remove the further research recommendation from abstract and keep in the main text.	Removed.
Introduction	
State the problem globally and continent-wide precisely.	<i>"Maternal mortality – measured as maternal mortality ratio (MMR) – remains a major concern despite the decline globally from 385 to 216 maternal deaths per 100,000 live births between 1990 and 2015. ¹ Sixty-six percent of all maternal deaths occur in sub-Saharan Africa (SSA)."</i> page 4 lines 61-63
State your research question precisely why it is interesting to write this	<i>"Sixty-six percent of all maternal deaths occur in sub-Saharan Africa (SSA).¹"</i>

article?	<p><i>this is concern if SSA is to achieve the Sustainable Development Goal (SDG-3)</i></p> <p><i>target of fewer than 70 maternal deaths per 100,000 livebirths by 2030.¹” Page</i></p> <p>4, Line 63-66</p>
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Methods	
Use logistic and multiple logistic regression instead of the terms- univariate and multivariate. (page-6, lines-49-50)	Corrected throughout the script.
I suggest authors for removing the following both sentences and describe sampling methods briefly in separate heading.	Removed
Study variable- 4 ANC visits, for ANC visit time is crucial. Would you specify recommended times of 4 ANC visits? If not, mention as the limitation of the study.	<p>We added “<i>Also, we did not study as a separate variables the four ANC timings</i></p> <p><i>–first visit 8-12 weeks, second visit 24-26 weeks, third visit 32 weeks, and the</i></p> <p><i>fourth visit 36-38 weeks.</i>” Pages 19 lines 88-90.</p>
Cite and make reference in details of your analysis software/s.	Cited. Ref 50
First, perform descriptive analysis	<p>The descriptive analysis is mentioned in the Methods (page 9, lines 182-191)</p> <p>and results are shown in the Table.</p>
Univariate and bivariate/ multivariate analysis	Were done based on the aORs
I suggest authors apply multivariate analysis for assessing the confounder’s effect on the utilization of maternal health care services.	We performed multivariate (aORs) with adjustment for five confounders.
Cite each table and figure in the text clearly.	Corrected.
Use only required statistics; present and interpret precisely.	Corrected.

Results	
<p>Comments from PDF: The results showed that the poor or marginalized relation between autonomy and utilization, hence, how could you recommend it?</p>	<p>We have changed the text and now recommend further research “...<i>Further research on women’s autonomy is needed in SSA....</i>” Page 20, Line 106-107.</p>
<p>Make a simple table including limited information...</p>	<p>While we understand the reviewer’s point of view, we think the data in the table is important so that readers, including policymakers, can see how the 31 countries compare on key socio-demographic characteristics that might confound observed relationships between autonomy and use of maternal health services.</p>
<p>Authors only performed univariate analysis of confounder factors; for assessing the association there has to be performed multivariate analysis. But they performed bivariate analysis considering women’s autonomy only.</p>	<p>We performed univariate and multivariate analyses (aORs). Odds ratios in the text and figures are all adjusted for five confounding variables.</p>
Discussion	
<p>In the first paragraph of the discussion, there has to discuss the major finding of the analyses briefly.</p>	<p>Corrected.</p>

Limitations	
<p>Limitations:</p> <ul style="list-style-type: none"> o Explain, how the cross-sectional studies could lead to underestimation or overestimation of the association (page 3, line 12 	<p>This has been added. Page 3 line 60-62</p>

...).	
Conclusion	
<p>Rewrite the conclusion considering confounder's effect:</p> <ul style="list-style-type: none"> - It is poorly supported by results. The results showed that the poor or marginalized relation between autonomy and utilization, hence, how could you recommend it? - There may be confounder effect in the low utilization of maternal health care services. e. g. education, economic conditions etc. - It needs further analysis considering confounder effect. - I suggest authors remove the further research recommendation from abstract and keep in the main text. - The conclusion has to be rewritten considering confounder effect why the utilization of maternal health care services is low in SSA? 	<p>The conclusion has been rewritten considering the effects of confounders effect. Page 20, para 1.</p>
General	
<p>Remove following sentence or keep in introduction and method section</p> <p>with breaking down. "Relevant to the current debate on how SSA will achieve the SDG-3 target by 2030, this study examined the association between women's autonomy and usage of maternal health services across 31 SSA countries. In the pooled results for all 31 countries</p>	<p>Removed.</p>

combined there were only weak, albeit statistically significant, associations between women's autonomy and utilisation of maternal health services.”	
Reorganize/ rewrite your discussion and conclusion considering your revision of methods and results sections.	Corrected.
Do not repeat the same information in the table, figure and text.	We have deleted some findings previously shown in the text in the Results. However, the other reviewer asked for more results to be included in the text

	and so we have added the main pooled odds ratios from each figure (as requested by Reviewer 2).
Use full-form of word/s before using the abbreviation.	Corrected.
Use simple past tense in the manuscript.	Simple past tense in the manuscript used in the discussion.
It needs language editing before re-submission.	The paper has been extensively edited.

Reviewer 2 comments from the manuscript and authors' responses

Reviewer 2	Author's responses
Abstract	
Results: (from reviewer two (email)): reported in the abstract don't reflect those reported in the results section of the main document... The abstract should summarise the	Pooled results have been summarised in the abstract with significant changes as suggested by the first reviewer as well. Page 2-3, Line 38-48.

major findings; let the authors summarise the findings by reporting the pooled results	
Conclusion: (from reviewer two (email)): In the conclusion (line 45), the authors state that “therefore, further research is needed in SSA to understand better why associations are weaker than in other parts of the world”.... Yet the findings no mention is made about associations in other parts of the world. Let the authors clarify this.	We have re-written the conclusion to delete mention of other parts of the world. We agree that the abstract should be free-standing without reference to the main text.
Introduction	
Introduction (From reviewer two (email)): Line 12 page ...write MMR in full before using abbreviations	Corrected
Line 17 and 18....”Increased utilisation of antenatal care (ANC) and skilled birth attendants (SBA) could help reduce the high maternal deaths on the continent”... Could the authors briefly summarise the main documented causes of maternal deaths before you suggest solutions	<i>“The leading causes of maternal deaths in SSA are abortion, haemorrhage, hypertension, obstructed labour and sepsis.”² Page 4 lines 66 -67.</i>
Line 38....The authors state that “Most of the studies that have examined the relationship between women’s autonomy and women’s health were conducted in South	In the systematic review by Osamor and Grady in 2016 (ref 27) , there were 11 autonomy studies from Asia and five from SSA. We have added the reference to Sialubanje et al. (ref 28) .

<p>and South-east Asia” I suppose that quite a lot of research</p> <p>has been conducted in SSA in this area, for example,</p> <p>Sialubanje et al. (2015).</p> <p>Study selection</p>	
<p>Line 27.....Malawi and Zambia are in central Africa, and</p> <p>not eastern Africa</p>	<p>There are many classifications of SSA countries by region. For this study, we used the</p> <p>Global Burden of Disease regions as published in the Lancet. Ref 2.</p>
<p>Methods</p>	
<p>Line 30....We restricted our analysis to the most recent</p> <p>child born in 5 years preceding each survey. Let the authors</p> <p>give reasons for this restriction....</p>	<p>We followed the DHS criteria which include women of reproductive age 15-49 who gave</p> <p>birth in the last five years preceding the DHS surveys.</p> <p>Page 6, Lines 111-112</p>
<p>DELETE</p>	
<p>Line 39: there are two outcomes provided...let the authors</p> <p>state which outcome is primary and which one is</p> <p>secondary..</p>	<p>Both outcomes are equally important. As this is not a randomised control trial, we do not</p> <p>think we need to specify primary and secondary outcome variables.</p>
<p>Line 41 SBA write it in full before using abbreviations</p>	<p>SBA is now written in full in both the abstract (page 2, Line 36) and the introduction before</p> <p>its abbreviated. Page 4, Line 68</p>
<p>Line 10 to 25....There seems to be overlap between the</p> <p>items that measure the two constructs: attitude towards</p> <p>sexual violence and attitude to domestic violence (they</p> <p>both include this item: if beating a wife by a husband for</p>	<p>We agree. That was an error. We deleted the repetitive phrase about sexual intercourse.</p>

refusing sexual intercourse with him is acceptable)	
<p>Page 7...There seems to be a methodological error. On page 6 you mention that you adjusted for 5 potential confounders...but on page 7 you report that these potential confounders were entered in models 1 and 2... this is not correct. Model 1 should have the independent or explanatory variables entered first from which you report the non-adjusted odds ratio (OR).</p>	This has been rewritten for clarity. Page 8, paragraph 2.
<p>If you think there is confounding as mentioned on page 6, you then control for these potential confounders by progressively entering them into the next stage, model 2 and 3..after this you derive and report the adjusted odds ratio (AOR).</p>	<p>We did what the reviewer suggested. This has been rewritten for clarity. Page 8, paragraph 2.</p>
Results	
<p>Table 1: Some percentages are not adding up to 100. Please check.</p>	<p>We thank the review for this/her thorough review. Corrected throughout the table.</p>
<p>There seems to be a problem in the labelling of the figures.</p> <p>Three of the figures are labelled figure 1.... With different content... this is confusing. Figure 2 and figure 3 are</p>	<p>Corrected.</p>

missing...	
In addition, in all the figures (1-8), the pooled OR should read pooled AOR since you have adjusted for potential confounders	Corrected.
In the results section, let the authors summarise the main results by providing the adjusted odds ratios (AOR)	We have added a slightly modified version of the text provided by the reviewer. Page 16, lines 8-17
Could the authors also assess the association between utilisation ANC and utilisation of SBA? And comment on this relationship in their discussion.	With respect, we do not think this is relevant to this paper. This study aims to examine the association between the four women's autonomies and the two outcome variables not associations between the two outcome variables.
Discussion	
Page 13 line 20 -28 this is a limitation of the study. Remove it and take it to the limitation section.	We respectfully disagree with the reviewer and believe that this text fits better here than in the limitation sections. <i>"We used women's attitudes to violence as well as women's participation in decisions (finance and major household purchases), while Ahmed et al. only examined women's autonomy about decisions. The paper by Ahmed et al. was published in 2010 and so used older DHS data than we did."</i> Page 17 lines 44-47
Page 13.... "Education has been shown to be associated with utilisation of maternal health services". You controlled for this potential confounder in your analysis....so it does not come in. Discuss your results and reasons for this weak association.	We thank the reviewer for this comment and completely agree. We have deleted mention of education as a possible reason for weaker associations than in Southern Africa and we have added a new paragraph with alternative explanations. <i>"Weaker associations in other African regions are unlikely to be explained by differences in women's education or household wealth, as we adjusted for these variables. The explanation is probably related to differences</i>

	<p><i>in economic development and culture across countries in SSA.⁵¹⁻⁵³ A qualitative study in Zambia found that factors leading to delivery at home rather than at a clinic included: lack of female autonomy, the influence of husbands and parents, perceived low quality of clinic-based services, and positive attitudes towards traditional birth attendants.²⁸ Jayachandran showed that the level of female autonomy tended to be higher in countries with higher GDP per capita.⁵³ Economic development is also associated with better education for men and women and higher quality health services. “Page 18, lines 59-68</i></p>
<p>Page 14....line 14...” One unexpected finding in our study is that women with higher autonomy...were less likely to utilise either ≥ 4 ANC or SBA”. Discuss this finding in more detail and provide reasons for this inverse relationship.</p>	<p>We have discussed this on page 18-19, lines 70-80.</p>
<p>Page 14...line 32-56 the limitation section needs to be re-done. Comment on why you found these unexpected findings; for example, the quality of the data used; methodological issues, etc.</p>	<p>We have re-worked the limitations section, including the addition of this sentence: <i>Poor measurement of autonomy may explain why we found such weak associations between autonomy and use of maternal healthcare services. Page 19 Lines 93-95.</i></p>
<p>Conclusion</p>	
<p>Conclusion The conclusion needs to be refined. You could include the</p>	<p>The conclusion has been revised reflecting the three recommendations raised by the reviewer.</p>

<p>following</p> <p>1) Comment on the overall goal of the study...</p> <p>Is the association between autonomy and</p> <p>2) service utilisation or not?</p> <p>What are the recommendations for policy,</p> <p>3) practice and future research directions?</p>	
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VERSION 2 – REVIEW

REVIEWER	Dr. Tulsi Ram Bhandari Faculty of Health Sciences, Pokhara University
REVIEW RETURNED	01-Nov-2018
GENERAL COMMENTS	No.