

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

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.

(This paper received three reviews from its previous journal but only two reviewers agreed to published their review.)

ARTICLE DETAILS

TITLE (PROVISIONAL)	Associations between effort-reward imbalance and health indicators among school teachers in Chuquisaca, Bolivia: a cross-sectional study
AUTHORS	Solis-Soto, Maria Teresa; Schön, Anabel; Parra, Manuel; Radon, Katja

VERSION 1 – REVIEW

REVIEWER	Dr. Jian Li, senior researcher University of Dusseldorf, Germany
REVIEW RETURNED	14-Jul-2018

GENERAL COMMENTS	<p>In most developed countries, much evidence has been gained that work stress is one of important risk factors among working people. However, few scientific reports are available from the developing countries. This present study, as the first one investigating the associations between work stress in terms of effort-reward imbalance and several health indicators in Bolivia, is timely and impressive.</p> <p>I have some comments which might be helpful to the authors.</p> <p>(1) Abstract: Participants: "A total of 1062 school teachers (response 56.2 %) were invited to participate." This sentence is misleading. Please write clearly that the sample size of this study was 597.</p> <p>Results: "19% reported LBP and 319% neck or shoulder pain." According to the Table 2, the prevalence was 17.4% for LBP and 29.1% for neck or shoulder pain.</p> <p>(2) Page 4, Line 54: "cardiovascular diseases,14" Please add one more reference here:</p> <p>Dragano N, Siegrist J, Nyberg ST, Lunau T, Fransson EI, Alfredsson L, Bjorner JB, Borritz M, Burr H, Erbel R, Fahlén G, Goldberg M, Hamer M, Heikkilä K, Jöckel KH, Knutsson A, Madsen IEH, Nielsen ML, Nordin M, Oksanen T, Pejtersen JH, Pentti J, Rugulies R, Salo P, Schupp J, Singh-Manoux A, Steptoe A, Theorell T, Vahtera J, Westerholm PJM, Westerlund H, Virtanen M, Zins M, Batty GD, Kivimäki M; IPD-Work consortium. Effort-Reward Imbalance at Work and Incident Coronary Heart</p>
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	<p>Disease: A Multicohort Study of 90,164 Individuals. <i>Epidemiology</i>. 2017 Jul;28(4):619-626.</p> <p>(3) Page 5, Line 2-7; Page 14, Line 46-48: These are about the interaction between ERI and OC. However, the references 17 and 50 are quite old. Please use the recent one:</p> <p>Siegrist J, Li J. Associations of Extrinsic and Intrinsic Components of Work Stress with Health: A Systematic Review of Evidence on the Effort-Reward Imbalance Model. <i>Int J Environ Res Public Health</i>. 2016 Apr 19;13(4):432.</p> <p>Also, the findings of ERI and OC interaction were mentioned in the "Discussion" instead of the "Results" section. The authors should give some essential information in the "Results" section.</p> <p>(4) Page 8, Line 14: "Job security was categorized into low/medium and high." I do not think job security is needed to be measured additionally in this study, because job security is one aspect of reward and the ERI questionnaire includes one item about job security already. Particularly, in the analyses of multivariable logistic regression, adjusting for job security would lead to over-adjustment. See also Page 10, Line 31.</p> <p>(5) Page 8, Line 29-31: "Effort-reward imbalance (ERI) and overcommitment (OC) were assessed using the Spanish short version of ERI questionnaire.³²" Actually the ERI questionnaire has been successfully applied in the Latin-American countries. The authors should mention it.</p> <p>Juárez-García A, Vera-Calzaretta A, Blanco-Gomez G, Gómez-Ortíz V, Hernández-Mendoza E, Jacinto-Ubillus J, Choi B. Validity of the effort/reward imbalance questionnaire in health professionals from six Latin-American countries. <i>Am J Ind Med</i>. 2015 Jun;58(6):636-49.</p> <p>(6) Page 9, Line 42-46: "For this study, we considered 7 days prevalence to define pain in the neck or shoulder (neck/shoulder pain) and low back pain." Please give the reason why the authors chose the 7 days of MSD, not the 12 months MSD?</p> <p>(7) Results</p> <p>Page 11, Line 31-40: "the median value for teachers working in rural areas was less favourable (0.91 vs. 0.96; $p < 0.001$) (Table 1). Considering ERI risk group ($ERI > 1$), results showed a significantly higher percentage of teachers working in rural areas in this group in comparison with urban areas (44 vs. 53%; $p < 0.001$)." The numbers here do not match the Table 1. The median was 0.82 and 0.96, percentage with $ER\text{-ratio} > 1$ was 22% and 35%, in urban teachers and rural teachers, respectively. Please check carefully.</p> <p>Page 12, Line 13-18: "In the univariate model, teachers in ERI risk group (scores > 1) were statistically significantly more likely to self-rate their overall health as fair or poor (adjusted Odds Ratio 2.7; 95% Confidence Interval 1.6-4.6)" In the Table 3, the unadjusted OR was 1.85 (95% CI 1.2-2.9). Please check carefully.</p> <p>The authors need to double check the numbers throughout the</p>
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	<p>entire manuscript!</p> <p>(8) Page 14, Line 53-55 and Page 15, 2-5: "The fact that overcommitment was not associated with most of the health outcomes and only borderline significantly related to overall self-rated health makes it unlikely that the association between ERI and the health outcomes was due to common methods bias." I do not understand how the authors reached this statement/conclusion. Please explain more and clearly.</p> <p>(9) Though the English writing of this manuscript is generally understandable, it would be beneficial to ask a native speaker to help with the language editing.</p>
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REVIEWER	Katsunori Yokoyama Kagawa Prefectural Government, Japan
REVIEW RETURNED	11-Sep-2018

GENERAL COMMENTS	<p>In the abstract, the objective is described as "to assess the association between effort-reward imbalance and health indicators among Bolivian school teachers", but in the text, at the latter part of the background chapter, you wrote that "the objective of this study was to compare working conditions and indicators of mental and physical health between teachers working in rural and urban areas."</p> <p>They are inconsistent. You should clearly define the research question and study objective.</p> <p>In addition, at the last sentence in the background chapter, you wrote "The results of this study will support of Bolivian workers" while you studied about only "teachers". It's too much of a leap.</p> <p>There are leaps also in the conclusions.</p> <p>Response rate in your study was not high. You wrote about the possibility of the underestimation. However, there is the possibility of the overestimation, too. If the teachers with dissatisfaction about their working conditions are likely to answer the survey questionnaires, the results might be overestimated.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Dr. Jian Li, senior researcher

Institution and Country: University of Dusseldorf, Germany

Please state any competing interests or state 'None declared': None declared.

In most developed countries, much evidence has been gained that work stress is one of important risk factors among working people. However, few scientific reports are available from the developing countries. This present study, as the first one investigating the associations between work stress in terms of effort-reward imbalance and several health indicators in Bolivia, is timely and impressive.

I have some comments which might be helpful to the authors.

Response: Thank you very much for the suggestions and comments to improve the study report.

(1) Abstract: Participants: "A total of 1062 school teachers (response 56.2 %) were invited to participate." This sentence is misleading. Please write clearly that the sample size of this study was 597.

Response: We include your suggestion in order to clarify the sentence.

Results: “19% reported LBP and 319% neck or shoulder pain.” According to the Table 2, the prevalence was 17.4% for LBP and 29.1% for neck or shoulder pain.

Response: Thank you. The mistake was corrected and all the percentages were checked again. Also, the results were updated when we reanalyze data excluding job security from the adjusted model.

(2) Page 4, Line 54: “cardiovascular diseases,14” Please add one more reference here:

Dragano N, Siegrist J, Nyberg ST, Lunau T, Fransson EI, Alfredsson L, Bjorner JB, Borritz M, Burr H, Erbel R, Fahlén G, Goldberg M, Hamer M, Heikkilä K, Jöckel KH, Knutsson A, Madsen IEH, Nielsen ML, Nordin M, Oksanen T, Pejtersen JH, Pentti J, Rugulies R, Salo P, Schupp J, Singh-Manoux A, Steptoe A, Theorell T, Vahtera J, Westerholm PJM, Westerlund H, Virtanen M, Zins M, Batty GD, Kivimäki M; IPD-Work consortium. Effort-Reward Imbalance at Work and Incident Coronary Heart Disease: A Multicohort Study of 90,164 Individuals. *Epidemiology*. 2017 Jul;28(4):619-626.

Response: Thank you very much! The reference was added.

(3) Page 5, Line 2-7; Page 14, Line 46-48: These are about the interaction between ERI and OC. However, the references 17 and 50 are quite old. Please use the recent one:

Siegrist J, Li J. Associations of Extrinsic and Intrinsic Components of Work Stress with Health: A Systematic Review of Evidence on the Effort-Reward Imbalance Model. *Int J Environ Res Public Health*. 2016 Apr 19;13(4):432.

Response: Thank you very much! The reference was included.

Also, the findings of ERI and OC interaction were mentioned in the “Discussion” instead of the “Results” section. The authors should give some essential information in the “Results” section.

Response: Thank you for your suggestion. A sentence about ERI and OC interaction was included in the results section.

(4) Page 8, Line 14: “Job security was categorized into low/medium and high.” I do not think job security is needed to be measured additionally in this study, because job security is one aspect of reward and the ERI questionnaire includes one item about job security already. Particularly, in the analyses of multivariable logistic regression, adjusting for job security would lead to over-adjustment. See also Page 10, Line 31.

Response: Thank you. You are right. The results were reanalyzed excluding job security

(5) Page 8, Line 29-31: “Effort-reward imbalance (ERI) and overcommitment (OC) were assessed using the Spanish short version of ERI questionnaire.³²” Actually the ERI questionnaire has been successfully applied in the Latin-American countries. The authors should mention it.
Juárez-García A, Vera-Calzaretta A, Blanco-Gomez G, Gómez-Ortiz V, Hernández-Mendoza E, Jacinto-Ubillus J, Choi B. Validity of the effort/reward imbalance questionnaire in health professionals from six Latin-American countries. *Am J Ind Med*. 2015 Jun;58(6):636-49.

Response: Thank you!! It was clarified and the reference was included.

(6) Page 9, Line 42-46: “For this study, we considered 7 days prevalence to define pain in the neck or

shoulder (neck/shoulder pain) and low back pain." Please give the reason why the authors chose the 7 days of MSD, not the 12 months MSD?

Response: Thanks for the comment about this. We decided to use 7 days of MSD, because it give us an idea about current but chronic or recurrent pain (disorder reported during the last 12 months and during the last 7 days, its mean, If no disorder was present in the last 12-months than also no disorder can be present in the last 7 days). It was clarified in the text.

(7) Results

Page 11, Line 31-40: "the median value for teachers working in rural areas was less favourable (0.91 vs. 0.96; $p < 0.001$) (Table 1). Considering ERI risk group (ERI > 1), results showed a significantly higher percentage of teachers working in rural areas in this group in comparison with urban areas (44 vs. 53%; $p < 0.001$)." The numbers here do not match the Table 1. The median was 0.82 and 0.96, percentage with ER-ratio > 1 was 22% and 35%, in urban teachers and rural teachers, respectively. Please check carefully.

Page 12, Line 13-18: "In the univariate model, teachers in ERI risk group (scores > 1) were statistically significantly more likely to self-rate their overall health as fair or poor (adjusted Odds Ratio 2.7; 95% Confidence Interval 1.6-4.6)" In the Table 3, the unadjusted OR was 1.85 (95% CI 1.2-2.9). Please check carefully.

The authors need to double check the numbers throughout the entire manuscript!

Response: Thank you very much for pointing this out. It was our mistake when transcribing the data. The information was revised and corrected. All the tables were again carefully reviewed.

(8) Page 14, Line 53-55 and Page 15, 2-5: "The fact that overcommitment was not associated with most of the health outcomes and only borderline significantly related to overall self-rated health makes it unlikely that the association between ERI and the health outcomes was due to common methods bias." I do not understand how the authors reached this statement/conclusion. Please explain more and clearly.

Response: Thanks for highlight this point. We agree that this point is not clear and this does not contribute much to the discussion, so we decided to remove it.

(9) Though the English writing of this manuscript is generally understandable, it would be beneficial to ask a native speaker to help with the language editing.

Response: The English of this revised version of the manuscript has been revised and corrected.

Reviewer: 2

Reviewer Name: Katsunori Yokoyama

Institution and Country: Kagawa Prefectural Government, Japan

Please state any competing interests or state 'None declared': None declared

In the abstract, the objective is described as "to assess the association between effort-reward imbalance and health indicators among Bolivian school teachers", but in the text, at the latter part of the background chapter, you wrote that "the objective of this study was to compare working conditions and indicators of mental and physical health between teachers working in rural and urban areas." They are inconsistent. You should clearly define the research question and study objective.

Response: Thank you very much for pointing this out. The wording of the objective in the text was corrected to maintain consistency.

In addition, at the last sentence in the background chapter, you wrote "The results of this study will support of Bolivian workers" while you studied about only "teachers". It's too much of a leap. There are leaps also in the conclusions.

Response: Thank you. We corrected the wording in the text (background and conclusions) clarifying that we only refer to teachers.

Response rate in your study was not high. You wrote about the possibility of the underestimation. However, there is the possibility of the overestimation, too. If the teachers with dissatisfaction about their working conditions are likely to answer the survey questionnaires, the results might be overestimated.

Response: Thanks for the observation. We added this point to the discussion.

VERSION 2 – REVIEW

REVIEWER	Dr. Jian Li, senior researcher University of Dusseldorf, Germany
REVIEW RETURNED	03-Oct-2018
GENERAL COMMENTS	The reviewer completed the checklist but made no further comments