PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Motivating factors on performance of primary care workers in China: A systematic review and meta-analysis
AUTHORS	Li, Huiwen; Yuan, Beibei; Wang, Dan; Meng, Qingyue

VERSION 1 – REVIEW

REVIEWER	Mark Harris UNSW Australia
REVIEW RETURNED	08-Feb-2019

GENERAL COMMENTS	This is a well conducted systematic review on motivating factors in primary care workers in China which has useful observations and implications for public health practice.
	The introduction provides a good overview of the situation with respect to primary care in China. Like the rest of the paper there are two many acronyms necessitating constant referral back to check on their meaning. Also it would be useful to expand a little on the characteristics of the four types of primary care services in China.
	The methods are also appropriate. However there needs to be a brief discussion of the reason R choosing Alderfer's ERG theory (apart from its widespread use) in preference to other non-needs based theories related to personality or the structure of organisations (eg task satisfaction).
	The papers were heterogenous. However there needs to be some quality assessment of the papers especially for those included in the meta-analysis. There also needs to be more detail on the measures of work satisfaction used to determine if they can indeed be meta-analysed. The different aspects of work satisfaction may be captured in some but not other measures. Thus the met-analysis may not be valid. The range of measures may explain some of the variance in job satisfaction.
	In other studies job satisfaction is correlated with individual age and mental state (eg more depressed with poorer satisfaction). Was this measured in any of the studies either directly or indirectly (eg suicide rates).
	Minor corrections: Line 256 " species" should be "classes" of essential medicines

REVIEWER	Ericson Gutierrez National Institute of Health (Perú)

REVIEW RETURNED	22-Feb-2019

GENERAL COMMENTS	The article needs to discuss its results with international references, for example I could cite the "Global Strategy on Human Resources for Health: Workforce 2030" https://www.who.int/hrh/resources/global_strategyHRH.pdf (WHO). In your first objective, "To implement evidence-based HRH policies to optimize impact of the current health workforce, ensuring healthy lives, effective Universal Health Coverage, and contributing to global health security", TARGET 1.1., "By 2030, 80% of countries have halved current levels of disparity in health worker distribution between urban and rural areas", It is stated that in order to improve the human resources, it should be "making the best possible use of limited resources, ensuring they are employed strategically through adoption and implementation of evidence-based health workforce policies tailored to the local context". Finally it is also expressed "improved deployment strategies and working conditions, reward systems, continuous professional development opportunities and career pathways for human resources for health, so as to enhance both capacity and motivation for improved performance", which coincides with your research results and should be included in the discusión.

REVIEWER	ZHANG Yan School of Medicine and Health Management,Huazhong University of Science and Technology; China
REVIEW RETURNED	04-May-2019

GENERAL COMMENTS	Low motivation of primary health workforce is a bottleneck for promoting work performance of on-service PCWs in China. This study aims to synthesize and analyze the motivating factors of PCWs and provide evidence-based policy implication, it is a significant contribution to the global literature on the study on motivating factors of PCWs. This paper has a strong representation with a systematic review and meta-analysis, and robust methodology. Good article, much work went into this. Good conclusions, relevant. Below are some comments/questions and suggestions, personally. 1. In terms of research significance, key conclusion in this research is "financial incentives and career advancement being two most important motivating factors", it is obvious and easy to understand. The advanced contribution is not obvious compared with other people's research. The research significance needs to be further strengthened. 2. In terms of research boundary, this study focused on performance motivation of China PCWs, here lacks of the specificity of China PCWs in the research background, the research gap. In theory, the performance motivation is consistent across the world. Please give more information about the practicality and specificity of the motivation of China PCWs, compare with the international researches. 3. Research defined motivation as an individual's degree of willingness to exert and maintain an effort towards organizational

	or system goals. Here how to measure and determine the consistency of key variables in different studies, it's a big question.
	4. As you told us, work motivation can influence job satisfaction, and then influence job performance. Here what's the performance in your context, healthcare provision volume, or health care technology? Moreover, the aim is motivating factors of PCWs, or motivating factors on performance of PCWs?
	5. The author valued job satisfaction expressed in both the results and discussion sections. But the relationship between job satisfaction and performance should be addressed.
	6. Based on Alderfer's ERG framework, system and policy factors should not be a separate theme, all policy factors could be settled on individual factors. As you pointed in the section of system and policy factors, just made an interpretation of several important policies, lack of a sub-theme in table1.
	7. In research design, this study mainly used a systematic review on performance motivation, followed by a meta-analysis on job satisfaction, this confused us.
	8. P3L47: "Primary care workers" should be "Primary care worker"

VERSION 1 – AUTHOR RESPONSE

Dear reviewer,

Thanks for the suggestions and comments on our manuscript. These comments will greatly enhance the quality of this manuscript. The issues you reminded us were carefully considered. We listed our responses point by point to all the comments in this letter. We also addressed these issues in the track changed revision in the revised manuscript.

We deeply hope our responses are satisfactory. Thank you again for your consideration and we shall await a favorable response to the revision.

Sincerely,

Huiwen Li

Comments and Suggestions for Authors:

This is a well conducted systematic review on motivating factors in primary care workers in China which has useful observations and implications for public health practice.

1. The introduction provides a good overview of the situation with respect to primary care in China. Like the rest of the paper there are two many acronyms necessitating constant referral back to check on their meaning. Also it would be useful to expand a little on the characteristics of the four types of primary care services in China.

Thank you for raising the question. Primary health care (PHC) institutions include community health service centres or stations in urban areas, township health centres and village clinics in rural areas. PHC institutions offer PHC services, including basic medical and public health services to residents in their communities. For better understand, we deleted one acronym – PHIs for primary health institutions and used PHC institutions instead. Moreover, we also expanded a little on the characteristics of the four types of PHC institutions. ("In China, the primary health care (PHC) services that include public health services and basic medical health services are provided by community health centres (CHCs) and their affiliated community health stations (CHSs) in the urban areas and by township health centres (THCs) and their affiliated village clinics (VCs) in the rural areas. These four types of PHC institutions constitute the essential part of China's three-tertiary health care delivery network. Administered by CHCs and THCs respectively, CHSs and VCs function as the satellite sites of their superior institutions.")

2. The methods are also appropriate. However there needs to be a brief discussion of the reason R choosing Alderfer's ERG theory (apart from its widespread use) in preference to other non-needs based theories related to personality or the structure of organisations (eg task satisfaction).

Thank you for raising the question. The theoretical lens of human needs effectively illustrates a concise picture linking PCWs' work motivations and performance, which meeting the aim of this study are designed. A brief discussion of the reason why choosing ERG theory has been appended.("The rationale for using ERG theory to guide the analysis lies in the fact that this needs-based theory generally encompasses work motivation, provides a useful conceptualization of what PCWs care about (motivating factors) and explains their performance in organizations. The findings of this review suggest that PCWs can be encouraged to perform well by positive motivations responding to satisfying ERG needs, but it should be interpreted with caution because of several limitations.") .

3. The papers were heterogenous. However there needs to be some quality assessment of the papers especially for those included in the meta-analysis. There also needs to be more detail on the measures of work satisfaction used to determine if they can indeed be meta-analysed. The different aspects of work satisfaction may be captured in some but not other measures. Thus the met-analysis may not be valid. The range of measures may explain some of the variance in job satisfaction.

Thank you for raising the question. Most of articles used Likert 5-point scales and only 2 articles used Likert 4-point scale. We converted these two scores into 5-point score: Overall satisfaction = summed score/maximum total score×5. Considering different aspects of job satisfaction may be captured, so we grouped dimensions by conceptual affinity and only used the generally item about the overall satisfaction scores to do meta-analysis. As the measurement of job satisfaction was very simple, so we just mentioned more details in the Supplementary materials. Now we accepted your advice and

added more details about the quality assessment in the Methods. "Methodological quality of the included studies was evaluated using Hoy's risk of bias tool which is adapted from the one developed by Leboeuf-Yde and Lauritsen11. Based on a total score, studies are put into three categories: low risk of bias (8-10), moderate risk of bias (5-7) and high risk of bias (0-4)" "We unified the measurement of overall job satisfaction by transforming different calculations into a 5-point rating scale and pooled the study-specific estimates using a random effects meta-analysis model to obtain an overall summary of the job satisfaction scores across studies14."

4. In other studies job satisfaction is correlated with individual age and mental state (eg more depressed with poorer satisfaction).   Was this measured in any of the studies either directly or indirectly (eg suicide rates).

Thank you for raising the question. The individual characteristics are important influencing factors of job satisfaction. As the main purpose of this review refer to the motivating factors which could be improved by institutions on performance of primary care workers. The age and mental state were individual characteristics which can not be intervened by health policies or management methods. So we did not discuss them in detail, but more details on all kinds of influencing factors of job satisfaction could be found in Supplementary Appendix 2. We also accepted your advice and mentioned this in the limitation part. "Third, factors related to personal sociodemographic characteristics and mental state were not analyzed as motivating factors. They were only exacted from the original article and presented as influencing factors, as shown in the Supplementary Appendix 2."

5. Minor corrections:

Line 256 " species" should be "classes" of essential medicines

Thank you for your conscientious review. This minor correction has been made. "At the same time, they also complained that they had lost patients' trust and work enthusiasm as the classes and total amount of essential medicines were not enough to meet daily treatment needs."

Dear reviewer,

Thanks for the suggestions and comments on our manuscript. These comments will greatly enhance the quality of this manuscript. The issues you reminded us were carefully considered. We listed our responses point by point to all the comments in this letter. We also addressed these issues in the track changed revision in the revised manuscript.

We deeply hope our responses are satisfactory. Thank you again for your consideration and we shall await a favorable response to the revision.

Sincerely,

Huiwen Li

Comments and Suggestions for Authors:

The article needs to discuss its results with international references, for example I could cite the "Global Strategy on Human Resources for Health: Workforce 2030" https://www.who.int/hrh/resources/global_strategyHRH.pdf (WHO). In your first objective, "To implement evidence-based HRH policies to optimize impact of the current health workforce, ensuring healthy lives, effective Universal Health Coverage, and contributing to global health security", TARGET 1.1., "By 2030, 80% of countries have halved current levels of disparity in health worker distribution between urban and rural areas", It is stated that in order to improve the human resources, it should be "making the best possible use of limited resources, ensuring they are employed strategically through adoption and implementation of evidence-based health workforce policies tailored to the local context".

Finally it is also expressed "improved deployment strategies and working conditions, reward systems, continuous professional development opportunities and career pathways for human resources for health, so as to enhance both capacity and motivation for improved performance", which coincides with your research results and should be included in the discusión.

Thank you so much for this comment to cite "Global Strategy on Human Resources for Health: Workforce 2030", which perfectly coincides with your research results. We accepted your advice and included in the discussion.

"Low motivation is at the crux of promoting the work performance of China's on-service PCWs. Policy makers should take into account all level of human needs that influence PCWs' motivation and start from the local reality to set priorities to ensure of PCWs' appropriate remuneration and career development opportunities. Just as illustrated by the Global Strategy on Human Resources for Health, efforts should be made to improve deployment strategies, working conditions, reward systems, continuous professional development opportunities and career pathways by adopting and implementing evidence-based health workforce policies that are tailored to the local context so as to make the best possible use of limited resources and enhance both capacity and motivation for improved performance52."

Dear reviewer,

Thanks for the suggestions and comments on our manuscript. These comments will greatly enhance the quality of this manuscript. The issues you reminded us were carefully considered. We listed our responses point by point to all the comments in this letter. We also addressed these issues in the track changed revision in the revised manuscript.

We deeply hope our responses are satisfactory. Thank you again for your consideration and we shall await a favorable response to the revision.

Sincerely,

Huiwen Li

Comments and Suggestions for Authors:

Low motivation of primary health workforce is a bottleneck for promoting work performance of on-service PCWs in China.

This study aims to synthesize and analyze the motivating factors of PCWs and provide evidence-based policy implication, it is a significant contribution to the global literature on the study on motivating factors of PCWs. This paper has a strong representation with a systematic review and meta-analysis, and robust methodology. Good article, much work went into this. Good conclusions, relevant.

Below are some comments/questions and suggestions, personally.

1.   In terms of research significance, key conclusion in this research is "financial incentives and career advancement being two most important motivating factors", it is obvious and easy to understand. The advanced contribution is not obvious compared with other people's research. The research significance needs to be further strengthened.

Thank you for your comment. We agree that finding special or unexpected conclusion can contribute to the significance of a study. Our study is a systematic review, and we tried to synthesize existing primary studies on motivation factors, we can find that most frequently verified and most important motivation factors. Until now studies exploring motivating factors of PCW have not been systematically reviewed and synthesized. For systematic review, whether the conclusion of systematic review is obvious or not is much depended on the key messages of original articles. The findings of this review add value to the current literature, as it included qualitative, quantitative and mix methods studies to present an overview motivating factors including both individual level factors and health system level factors on performance of PCWs in China. It is a significant contribution to the global literature on the study on motivating factors of PCWs. We have added some information on significance of this study in "There has been an expanding body of studies exploring the motivating factors for PCWs through qualitative, quantitative or mixed methods, but the study sites and methodological quality of these studies varied. Synthesizing these motivating factors in different areas of China could help identify the most important motivating factors and appreciate the overall job satisfaction level of PHWs in China. In addition, synthesizing the motivating factors for PCWs and analyzing the complexity pathway between motivating factors and performance hold general and applicable implications for improving the motivation and performance of China's PCWs."

2.   In terms of research boundary, this study focused on performance motivation of China PCWs, here lacks of the specificity of China PCWs in the research background, the research gap. In theory, the performance motivation is consistent across the world. Please give more information about the practicality and specificity of the motivation of China PCWs, compare with the international researches.

Thank you for your comment. The research gap has been added in the introduction. "There has been an expanding body of studies exploring the motivating factors for PCWs through qualitative, quantitative or mixed methods, but the study sites and methodological quality of these studies varied. Synthesizing these motivating factors in different areas of China could help identify the most important motivating factors and appreciate the overall job satisfaction level of PHWs in China. In addition, synthesizing the motivating factors for PCWs and analyzing the complexity pathway between motivating factors and performance hold general and applicable implications for improving the motivation and performance of China's PCWs." Regarding the similarity in motivating factors across the world, it is same for all human beings for the needs, so the all motivating factors are same for all health workers. But in different settings, and for different health workers with different characteristics, the most important motivation factors are different. This is the purpose of this review, by synthesizing and comparing all studies on motivation factors of PCWs in China we could find the most important motivation factors in China. We also categorize one special class of influencing factors of motivation for PCWs in China, which are China health system reforms and how these reforms influenced motivation.

3.   Research defined motivation as an individual's degree of willingness to exert and maintain an effort towards organizational or system goals. Here how to measure and determine the consistency of key variables in different studies, it's a big question.

Thank you for your comment. Motivation was measured and expressed in different ways under different theories and different studies. We further refine the inclusion criteria here. "In this study, motivation in the work context is defined as an individual's degree of willingness to exert and maintain an effort towards organizational or system goals 10, and the degree of job satisfaction, work stress and turnover intention seen as possible reflections of motivation which may influence work performance. Therefore, all the studies that explored the level of work motivation, job satisfaction, work stress, turnover intention and the influencing factors of these motivation expressions were included."

4.   As you told us, work motivation can influence job satisfaction, and then influence job performance. Here what's the performance in your context, healthcare provision volume, or health care technology? Moreover, the aim is motivating factors of PCWs, or motivating factors on performance of PCWs?

Thank you for your comment. There are many kinds of expressions for work motivation, including motivation to leave, motivation to stay and perform well. We have classified the included studies based on the basic categories as Table 1. Regarding the performance, we include willingness to improve performance and any other performance measures defined by study authors, such as Job performance scale (JPS), a subjective rating of job performance. Actually for most of studies focusing

on motivation factors of health workers, they mainly measured the motivation factors and willingness, and few measured the objective performance outcomes.   As we explained in the manuscript, we assumed that all motivation expressions are connected: motivation to join, stay or leave all have an indirect impact on job performance. So this study targeted motivating factors for PCWs, which included motivating factors for performance of PCWs, and all motivating factors of PCWs can influence the performance of PCWs even they were measured directly as the influencing of motivating factors of stay or leave in some studies. .

5.   The author valued job satisfaction expressed in both the results and discussion sections. But the relationship between job satisfaction and performance should be addressed.

Thank you for your comment. Job satisfaction was positively associated with job performance and nearly half selected articles studied on job satisfaction with quantitative measurement, so we valued job satisfaction. The relationship between job satisfaction and performance has been addressed in Methods. "As job satisfaction was positively associated with job performance13 and nearly half of the selected articles studied job satisfaction with quantitative measurement, we resorted to meta-analysis to synthesize the 16 articles that provide data of PCWs' job satisfactions."

6.   Based on Alderfer's ERG framework, system and policy factors should not be a separate theme, all policy factors could be settled on individual factors. As you pointed in the section of system and policy factors, just made an interpretation of several important policies, lack of a sub-theme in table 1.

Thank you for your comment. Based on Alderfer's theory, the ERG needs have three categories, in a hierarchy from low to high, are existence, relatedness, and growth. The hierarchy among needs has been criticized for ignoring the cultural and organizational context. That's why we tried to add system and policy contextual factors as a supplement of the ERG theory, which might influence ERG needs at macro level. We agree with the reviewer that we should made a better demonstrate of the two levels of factors (Individual level based on ERG theory and macro-level). We have explained how each policy influence what kinds of health workers and then motivation of health workers in Discussion part, like "At the beginning of the NBPHSP, the PCWs responsible for basic public health services held negative attitudes toward the sustainable provision of these services because it was accompanied by a heavier workload and insufficient subsidy to compensate their efforts 38 40 46 53……". Besides, we also made an interpretation of several important policies mentioned in this study. These corrections have been made in Table 1.

7.   In research design, this study mainly used a systematic review on performance motivation, followed by a meta-analysis on job satisfaction, this confused us.

Thank you for your comment. The key content is the systematic review on motivating factors of PCWs. The meta-analysis of job satisfaction is the second key content because nearly half selected articles studied on job satisfaction, which positive related to job performance with unified quantitative measurement. We added this extra part so as to rich the results and provide more information of

current motivation status of Chinese PCWs, and this was rarely synthesized in published studies. The explanation has been made in Methods. "As job satisfaction was positively associated with job performance13 and nearly half of the selected articles studied job satisfaction with quantitative measurement, we resorted to meta-analysis to synthesize the 16 articles that provide data of PCWs' job satisfactions. We unified the measurement of overall job satisfaction by transforming different calculations into a 5-point rating scale and pooled the study-specific estimates using a random effects meta-analysis model to obtain an overall summary of the job satisfaction scores across studies 14."

8.   P3L47: "Primary care workers" should be "Primary care worker"

Thank you for your conscientious review. This minor correction has been made.

VERSION 2 – REVIEW

REVIEWER	Mark Harris
	University of New South Wales, Sydney, Australia
REVIEW RETURNED	12-Jul-2019

GENERAL COMMENTS	I have reviewed the authors response and the revised paper. The authors have adequately addressed all the points raised in my previous review. I have no further comments to make on the paper.

REVIEWER	ZHANG Yan
	Huazhong University of Science and Technology
REVIEW RETURNED	22-Jul-2019

GENERAL COMMENTS	Motivating factors on performance of primary care workers in China: A systematic review and meta-analysis
	In their revision, the authors have carefully, and convincingly, addressed all concerns and criticism raised in my first Review. I have no further comments and congratulate to this impressive work.
	One useful comment：
	I'm still confused the relationship between 4 factors, in my opinion, all policy factors could be settled on individual factors, and individual factors affects each other, as below, the frustration-regression is the core of Alderfer's ERG framework. It is recommended to add a logical diagram of the results 2 （motivating

factors for PCWs）, indicating the logical levels of the various factors. It's easier to have a comprehensive understanding.
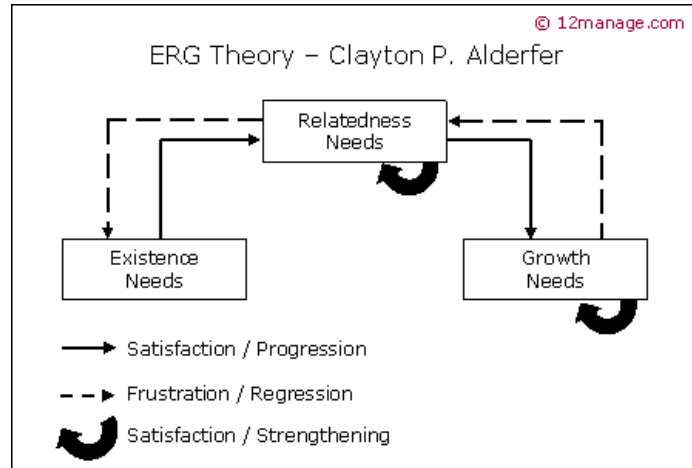
VERSION 2 – AUTHOR RESPONSE

Thanks for the suggestions and comments on our manuscript. The issues you reminded us were carefully considered. We added two figures in the Supplementary Appendix 2 and 3.

We deeply hope our responses are satisfactory. Thank you again for your consideration and we shall await a favorable response to the revision.

VERSION 3 – REVIEW

REVIEWER	ZHANG Yan Huazhong University of Science and Technology
REVIEW RETURNED	24-Oct-2019

GENERAL COMMENTS	In their revision, the authors have carefully, and convincingly, addressed all concerns and criticism raised in my first Review. I have no further comments and congratulate to this impressive work.