

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Self-Management and Blood Pressure Control in China: A Community Based Multicenter Cross-Sectional Study
AUTHORS	Qu, Zhan; Parry, Monica; Liu, Fang; Wen, Xiuling; Li, Jieqiong; Zhang, Yanan; Wang, Duolao; Li, Xiaomei

VERSION 1 – REVIEW

REVIEWER	James Sheppard University of Oxford
REVIEW RETURNED	13-Sep-2018

GENERAL COMMENTS	<p>The stated aims of this study are to examine the association between self-management and BP control. In fact it presents data examining a number of factors and their association with BP control, including those related to 'self-management theory'. The design and execution of this study appear valid, but the rationale and interpretation is very confusing and requires some revision.</p> <p>Major points</p> <ol style="list-style-type: none">1. The focus on self-management in the introduction makes me question the appropriateness of the study design. There is a huge body of evidence from randomised controlled trials (which is not mentioned at all) detailing the association between self-management and BP control. RCT methodology is much better suited to answering this question. This study does provide useful data on factors which predict BP control in a Chinese population, but I think the initial focus on self-management is misplaced and confusing. If the authors wish to keep the focus on self-management, they must acknowledge the large body of RCT evidence in this area and explain how their work fits in.2. I am not familiar with individual and family self-management theory (I understand this is a newly developed measure by the authors?) but it strikes me that this makes up only part of the factors examined in the logistic model. I would suggest re-focusing the study on 'factors which predict BP control on a Chinese population' to inform the development of future interventions to improve BP control.3. I do not understand the focus on sex and gender throughout the paper. The introduction provides a detailed discussion of gender roles and their possible association with BP control, yet this isn't actually examined in the analysis (beyond including sex as a term in the logistic model). Bivariate analyses by sex are presented, but if focussing on gender, it would make sense to use these to define interaction terms in the final model (e.g. bivariate analyses suggest for example that men have higher education than women,
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	<p>so why not include an interaction term for sex*education in the BP control model?). Personally I don't agree with the idea of 'measuring masculinity' based on jobs, income, etc. as suggested in the cited paper by Smith & Koehoorn but if the authors wish to keep such extensive discussion of the association between gender and BP control, the results need to provide some data on this.</p> <p>Minor points</p> <p>4. I think the overall paper could be significantly shortened by making the intro more focussed, and removing much of the discussion which is not based on the actual results presented.</p> <p>5. The 'bias' section in the methods and discussion fails to acknowledge the most important bias in cross-sectional studies which is unmeasured confounding</p> <p>6. The strength and limitations section needs revising - why are these strengths?</p> <p>7. Recruiting patients does not represent PPI. Better just to say that patients and the public were not involved in the design or interpretation of this study.</p>
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REVIEWER	Lenette M. Jones University of Michigan, USA
REVIEW RETURNED	27-Oct-2018

GENERAL COMMENTS	<p>Overall - This paper was well written and explored an important topic. There are several typos and errors in grammar that should be addressed, but are only a minor distraction from the quality of this work.</p> <p>Abstract - "Outcome measurements" section needs to be reworded. A patient reported survey is not an outcome.</p> <p>BP should be defined before using the acronym.</p> <p>Self-management should be defined the first time this term is used in the abstract.</p> <p>Background - "Successful self-management strategies for individuals can result in effective control of blood pressure^{20 21} and the sustainability of healthcare systems.²²" It is not clear how self-management strategies can help sustain a health care system.</p> <p>Methods - how was cognitive impairment defined?</p> <p>What is meant by "well-trained research assistants"</p> <p>Family history of HTN was based on current BP and not a diagnosis of HTN?</p> <p>Where is the supplement with the information about the self-management scale? This is the main outcome of the paper - much more detail is needed about the 5 subscales and what concepts are being measured.</p> <p>There is no mention of the new suggestions the HTN is BPs greater than 130/80 mmHg</p>
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	<p>Additional information is needed about how the sample size calculations were performed.</p> <p>Ninety people could not participate due to cognitive impairment? Again, more information is needed about how the authors defined cognitive impairment.</p> <p>What is meant by "abnormal BMI"?</p> <p>The section of text that begins with "Women were older than men..." does not compliment Table 1. Are the authors trying to highlight the differences between the groups? if so the statistics provided are distracting and should be removed, or placed in Table 1.</p> <p>Same issue with Table 2 and the next paragraph - this information should be described in words with minimal statistical information provided to support the text. The means and standard deviations are distracting here and may be better suited for the table.</p> <p>Outcomes - " All models were controlled for personal income, health insurance, disease duration." How were personal income controlled for and used as an outcome in the same analysis?</p> <p>Some of the information in the discussion was presented more than once. Headings would help to organize this section, for both the authors and readers. It would be more helpful if the authors stated a finding, related it to existing literature, and explained their thoughts about the findings of this study in one paragraph, before moving on to the next finding.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1

COMMENTS FOR THE AUTHOR:

Reviewer 1: To the authors:

The stated aims of this study are to examine the association between self-management and BP control. In fact, it presents data examining a number of factors and their association with BP control, including those related to 'self-management theory'. The design and execution of this study appear valid, but the rationale and interpretation is very confusing and requires some revision.

Major points:

1. The focus on self-management in the introduction makes me question the appropriateness of the study design. There is a huge body of evidence from randomized controlled trials (which is not mentioned at all) detailing the association between self-management and BP control. RCT methodology is much better suited to answer this question. This study does provide useful data on factors which prediction BP control in a Chinese population, but I think the initial focus on self-management is misplaced and confusing. If the authors wish to keep the focus on self-management, they much acknowledge the large body of RCT evidence in this area and explain how their work fits in.

Response: Thank-you for this comment.

It is true that there is evidence from RCT studies to support self-management programs for blood pressure control conducted in the United States (US) and other developed countries. However, there is little evidence to support self-management interventions for blood pressure control in China, especially within the context of community health care. The Chinese government launched the public health service programs in 2009, and as a result, community residents' health has become an important focus of the government and community health centers within China. Hypertension is a serious public health problem in China; it has increased almost 400% from 1980 to 2015 (from estimated 59 million to 244.5 million), and accounted for over 2 million deaths or 24.6% of all-cause mortality. Before undertaking an RCT to evaluate a self-management intervention for blood pressure control, it is important to explore the self-management factors that actually affect blood pressure control in men and women in China. We chose to evaluate these in a cross-sectional study in eight community health centers from four cities in the northeast (Shenyang), northwest (Xi'an), southwest (Chengdu), and south (Changsha) of China.

The individual and family self-management theory (IFSMT) aligns well with the chronic care model and was used as our guiding framework to describe the context and process variables that impact blood pressure control (outcomes). Results of our study will assist us to design and evaluate a culturally tailored self-management intervention. We do acknowledge the comment of the reviewer regarding RCT evidence linking self-management to blood pressure control in developed countries and have added this to the background section of our manuscript.

2. I am not familiar with individual and family self-management theory (I understand this is a newly developed measure by the authors?) but it strikes me that this makes up only part of the factors examined in the logistic model. I would suggest re-focusing the study on 'factors which predict BP control on a Chinese population' to inform the development of future interventions to improve BP control.

Response: We thank the reviewer for this very thoughtful comment.

The individual and family self-management theory is a fairly new mid-range descriptive theory described by Ryan and Sawin in 2009. We chose this theory to guide our study because of its focus on the contextual and process variables that affect the health of individuals. Personal efforts to engage in healthy behaviours are often affected by condition-specific factors (context) that may be incongruent with health, such as cultural traditions, access to healthcare, transportation, social capital, and individual (literacy, sex/gender) and family characteristics/composition. Process variables that affect health according to this model include knowledge and beliefs, self-regulation and social facilitation. We felt these contextual and process factors were important to investigate and thus chose this theory to guide our work. We collected 22 variables that represented the context and process of self-management and ran these in our multivariable logistic regression models. So, we agree with the reviewer that focusing on factors which predict BP control in a Chinese population is important. This is why we utilized the individual and family self-management theory to guide our work as it included all contextual and process variables important to BP control in the Chinese population.

3. I do not understand the focus on sex and gender throughout the paper. The introduction provides a detailed discussion of gender roles and their possible association with BP control, yet this isn't actually examined in the analysis (beyond including sex as a term in the logistic model). Bivariate analyses by sex are presented, but if focusing on gender, it would make sense to use these to define interaction terms in the final model (e.g., bivariate analyses suggest for example that men have higher education than women, so why not include an interaction term for sex*education in the BP control model?). Personally, I don't agree with the idea of 'measuring masculinity' based on jobs, income, etc. as suggested in the cited paper by Smith & Koehoorn but if the authors wish to keep such extensive discussion of the association between gender and BP control, the results need to provide some data on this.

Response: We thank the reviewer for this very thoughtful comment.

Sex and gender are distinct concepts that are often used interchangeably in the literature. Although sex is used to describe the biological characteristics of men and women, gender represents the social norms and expectations ascribed to men and women. Gender is often described by gender roles, identity, relationships and institutionalized gender but it is less clear how one measures gender across various ethnicities. Smith and Koehoorn describe a method to measure gender when a gender measure does not exist. They describe four gender components; including responsibility caring for children, occupation segregation, hours of work and level of education. The effect of gender on health outcomes in a Chinese population is important, and because a validated gender measure does not exist we used Smith and Koehoorn interpretation of gender to guide our work. We do agree with the comment of the reviewer and have added the interaction term education*income as our best measure of gender into our model. Although this did not show statistical significance, it does suggest that a more robust measure of gender that includes gender roles, identity, relationships and institutionalized gender needs to be incorporated into future research.

Minor points:

4. I think the overall paper could be significantly shortened by making the intro more focused, and removing much of the discussion which is not based on the actual results presented.

Response: Thank you for this comment. We have made the introduction and the discussion more focussed.

5. The 'bias' section in the methods and discussion fails to acknowledge the most important bias in cross-sectional studies which is unmeasured confounding.

Response: We thank the reviewer for this very thoughtful comment. We have revised this section by adding this source of bias in cross-sectional studies.

6. The strength and limitations section needs revising - why are these strengths?

Response: Thank-you for your comments. We have revised this section.

7. Recruiting patients does not represent PPI. Better just to say that patients and the public were not involved in the design or interpretation of this study.

Response: Thank-you for your comments. We have revised this section.

Reviewer 2

COMMENTS FOR THE AUTHOR:

Reviewer 2: To the authors:

1. Overall - This paper was well written and explored an important topic. There are several typos and errors in grammar that should be addressed, but are only a minor distraction from the quality of this work.

Response: We thank the reviewer for the positive feedback and have corrected the typos and grammatical errors.

2. Abstract - "Outcome measurements" section needs to be reworded. A patient reported survey is not an outcome.

Response: Thank-you for this comment. The abstract has been revised.

3. BP should be defined before using the acronym.

Response: Thank-you for this comment. We have addressed the reviewer's comment.

4. Self-management should be defined the first time this term is used in the abstract.

Response: Thank-you for this comment. We have defined self-management in the abstract.

5. Background - Successful self-management strategies for individuals can result in effective control of blood pressure [20, 21] and the sustainability of healthcare systems [22]. It is not clear how self-management strategies can help sustain a health care system.

Response: Thank-you for this comment. We have tried to make this clearer in the background section.

6. Methods - how was cognitive impairment defined?

Response: Thank-you for this question. We defined cognitive impairment as the inability to process thoughts or concentrate to answer questions. This included difficulty remembering the names of people and/or the places. We have added this to the method section.

7. What is meant by well-trained research assistants?

Response: Thank-you for this question. Well-trained research assistants mean a standard approach to training the research assistants across the recruitment sites. We have clarified this in the manuscript.

8. Family history of HTN was based on current BP and not a diagnosis of HTN?

Response: Thank-you for this question. Family history of hypertension was defined as a blood relative such as mother, father, sister, or brother who has or was diagnosed with hypertension (SBP \geq 140 or DBP \geq 90). We have clarified this in the manuscript.

9. Where is the supplement with the information about the self-management scale? This is the main outcome of the paper - much more detail is needed about the 5 subscales and what concepts are being measured.

Response: Thank-you for this comment. We have added the self-management scale as a supplementary file and provide more detail about the five subscales within the body of the manuscript. This Self-management Scale for Patients with Hypertension is a newly developed Chinese measure developed and tested by the corresponding author; published as Development and Testing of the Reliability and Validity of the Self-Management Scale for Patients with Hypertension, in Hu Li Yan Jiu 护理研究 Nursing Research in Chinese) 2015 ; 29(5):1764-67. The reference has also been added to the manuscript.

10. There is no mention of the new suggestions the HTN is BPs greater than 130/80 mmHg.

Response: Thank you for this comment. This is a very interesting topic that has generated a lot of recent discussion in China since the new HTN guidelines were published. However, in China, we still adopt the standard of HTN defined as 140/90.

11. Additional information is needed about how the sample size calculations were performed.

Response: Thank-you for this comment. We based our sample size on 15 to 30 subjects per predictor in the logistic regression model. The number of predictors was guided by the context and process factors of the individual and family self-management theory. We anticipated 22 predictors so the final sample size was estimated at 660, which was increased to a total of 792 participants to account for an estimated 20% attrition (n=106 participants from each community health care center).

12. Ninety people could not participate due to cognitive impairment? Again, more information is needed about how the authors defined cognitive impairment.

Response: Thank-you for this comment. We have added the definition of cognitive impairment to the manuscript.

13. What is meant by "abnormal BMI"?

Response: Thank-you for this question. Abnormal BMI for Asians was defined as underweight BMI<18.5kg/m2), overweight (BMI 24.0-27.95kg/m2) and obese (BMI≥28kg/m2) according to the guidelines for prevention and control of overweight and obesity in Chinese adults. 48-50 This has been clarified in the manuscript.

14. The section of text that begins with "women were older than men..." does not compliment Table 1. Are the authors trying to highlight the differences between the groups? if so the statistics provided are distracting and should be removed, or placed in Table 1.

Response: Thank-you for this comment. We have revised the text and Table 1 to make this clearer.

15. Same issue with Table 2 and the next paragraph - this information should be described in words with minimal statistical information provided to support the text. The means and standard deviations are distracting here and may be better suited for the Table.

Response: Thank-you for this comments. We have revised the text and Table 2 to make this clearer.

16. Outcomes - All models were controlled for personal income, health insurance, disease duration. How were personal income controlled for and used as an outcome in the same analysis?

Response: Thank-you for this question. Multivariate logistic regression was used to investigate the relationship between self-management contextual and process factors and blood pressure control. We used a hierarchical approach to build a final model by cumulatively adding clusters of variables, starting with demographic contextual factors (e.g., age, sex, marital status, education, employment, personal income, and health insurance), then adding other contextual risk factors (e.g., BMI, WC, family history, comorbidities, smoking and drinking), and then self-management process factors in Model 3. Models 2 adjusted for demographic contextual factors (e.g., personal income and health insurance) and Model 3 adjusted for both demographic and other risk contextual factors. We have tried to make this clearer in the manuscript.

17. Some of the information in the discussion was presented more than once. Headings would help to organize this section, for both the authors and readers. It would be more helpful if the authors stated a finding, related it to existing literature, and explained their thoughts about the findings of this study in one paragraph, before moving on to the next finding.

Response: Thank-you for this feedback. We have added sub-headings to the discussion and better linked the results to the existing literature.

VERSION 2 – REVIEW

REVIEWER	Lenette Michelle Jones University of Michigan
REVIEW RETURNED	02-Jan-2019

GENERAL COMMENTS	<p>The authors have made significant improvements to this paper, yet there are other minor revisions that need to be made. There are also some grammatical errors that remain, such as, "It has not been widely used and need further psychometric testing." on page 3.</p> <p>Abstract 1. The definition of self-management is provided at the end of the abstract and is not helpful to the reader.</p>
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	Methods - It is still not clear to the how individuals were excluded if they were cognitively impaired, was there a measure? A cut-off point?
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 2

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

Response: Thank-you for this comment. We have revised this sentence on page 19.

The authors have made significant improvements to this paper, yet there are other minor revisions that need to be made. There are also some grammatical errors that remain, such as, "It has not been widely used and need further psychometric testing." on page 3.

Response: We thank the reviewer for this comment. We have revised this sentence on page 3 and have also re-read the manuscript carefully for other grammatical errors.

Abstract

1. The definition of self-management is provided at the end of the abstract and is not helpful to the reader.

Response: We thank the reviewer for this comment and have added examples to illustrate the definition of self-management in Abstract.

Methods - It is still not clear to the how individuals were excluded if they were cognitively impaired, was there a measure? A cut-off point?

Response: We thank the reviewer for this comment. Individuals with cognitive impairment were excluded according to their health record in the community health center. Cognitive impairment at the community health centre was assessed by physicians using the Montreal Cognitive Assessment [MoCA] Chinese version-Beijing version. Individuals who scored under the recommended cut-off of 26 were excluded from the study. We have revised this section on page 8.