

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)	Impact of acculturation and psychological adjustment on mental health among migrant adolescents in Guangzhou, China: a cross-sectional questionnaire study
AUTHORS	Shi, Lishuo; Chen, Wen; Bouey, Jennifer; Lin, Yanwei; Ling, Li

VERSION 1 – REVIEW

REVIEWER	Lue Fang National University of Singapore, Singapore
REVIEW RETURNED	04-Jun-2018

GENERAL COMMENTS	<p>The manuscript "impact of psychological integration and acculturation on mental health among migrant adolescents in Guangzhou, China: A cross-sectional questionnaire study" explores an important yet underresearched topic of acculturation and mental health outcomes among China's rural to urban migrant youth.</p> <p>The study has many interesting findings but also has major weaknesses that need to be addressed.</p> <p>First, the definitions of the study variables including social integration, psychological integration, and acculturation were not properly defined and distinguished given the closeness in meanings. Authors used social vs. psychological integration interchangeably but did not provide a strong theoretical basis on why social integration encompasses and is represented by both psychological integration and acculturation (I assumed it is psychological acculturation at the individual level).</p> <p>In this study, acculturation was studied as a single dimension variable which is similar to the concept of assimilation (adoption of culture in host city). The theory of acculturation (Berry, 2003) suggested that there are four possible states of acculturation including integration, assimilation, separation, and marginalization. Authors are advised to discuss why a single-dimension acculturation concept is adopted in this study.</p> <p>The way psychological integration has been measured and conceptualized seems to be problematic. Integration usually refers to the adoption of both cultures (origin and host), the measuring construct of psychological integration is only focused on host city ("do you like guanzhou?" "are you satisfied with your life in GZ?").</p>
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	<p>These questions seem to reflect an overall psychological adjustment rather than integration.</p> <p>Authors did not provide enough theoretical justification relating to the pathway from acculturation to integration to mental health. Given the cross-sectional nature of the research, justifications for the mediation pathway should be spelled out as especially tight. A potential analytical strategy is to conduct alternative models with integration as a predictor and acculturation as a mediator and compare models using chi-square difference test.</p> <p>In page 7, acculturation was reported to include three latent variables, but in the analysis, only three latent variables (language, customs, and social interactions) are shown, authors should have constructed a second-order CFA model for acculturation and include acculturation as a general latent variable in the final SEM. Authors are advised to report the factor loadings of all measuring constructs of integration, acculturation and mental health outcomes (both depression and anxiety). Authors are advised to report the descriptive, and normality index for depression and anxiety outcomes.</p>
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REVIEWER	Repeepong Suphanchaimat IHPP, MOPH, Thailand
REVIEW RETURNED	14-Aug-2018

GENERAL COMMENTS	<p>Major comments</p> <p>ABSTRACT</p> <ul style="list-style-type: none"> - In article summary, the authors should discuss more on new knowledge from the study rather than showing study limitations. Thus the two last bullet points should be something related to policy recommendations. <p>INTRODUCTION</p> <ul style="list-style-type: none"> - Please describe other risk factors that affect mental health, such as drug abuse, and parental mental health. If those variables do affect mental health, to what extent you incorporate them in the model (as it seems that you use only participants' demographic data as the only covariates) - What is the proportion of internal migrants who are not (and are not) in schools in the Guangzhou? Such data will provide a useful insights of the participant representativeness. <p>METHODS</p> <ul style="list-style-type: none"> - Have you calculated the sample size? If so, please describe the formula behind. If not, at least you should mention this point in the discussion section. - As per your inclusion criteria, a student would be included if one of his/her parents did not have hukou. If so, it means that your results cannot claim that the association between MDD/Anxiety and social integration is 'unique' amongst internal migrants. If you have data of students where both parents have hukou, this might be super useful as this population can be used as comparison group. If not, you should mention this as a key limitation. <p>RESULTS</p> <ul style="list-style-type: none"> - Please add a table summarizing degree of direct and indirect effects of all variables from the SEM as well as their 95% CI (though you have already shown these in Fig 2-3).
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	<ul style="list-style-type: none"> - I guess that most of the parameters are not normally distributed, therefore showing median and interquartile range might be useful. <p>DISCUSSION</p> <ul style="list-style-type: none"> - It is better to divide the discussion part into subsections, namely, result discussion, methodological discussion, and policy recommendations. - You attempt to explain why customs lead to negative effect on anxiety through Berry's theory. I am not totally convinced in this explanation. If it appears as what you mention, those who become familiar with the customs should be less anxious while the negative effect should be present amongst those who are in the process of integrating with the new customs. Therefore you should have extra-analysis to back up this assumption. Say subgroup analysis between those with longer stay and those with short stay in the study area. <p>Minor comments</p> <ul style="list-style-type: none"> - In intro part <ul style="list-style-type: none"> o Please describe the definitions of several terms like 'acculturation', 'customs', 'social integration'— to name a few. This will help audiences who are not familiar with this field to better know the study objectives. - In methods part <ul style="list-style-type: none"> o Though you use purposive sampling on schools, please describe the rationale behind the selection (purposive by what?) - In results part, <ul style="list-style-type: none"> o Please add descriptive data of custom in percentage of participants rather than saying 'majority' (page 13, line 11-16) o In the issue 'know the local language well', please describe how you measure the level of proficiency of participants (page 13, line 18-21) - In discussion part <ul style="list-style-type: none"> o Please detail more about Berry's theory and the findings from other studies (page 18, line 9)
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VERSION 1 – AUTHOR RESPONSE

Reviewer #1s' Comments

The manuscript "impact of psychological integration and acculturation on mental health among migrant adolescents in Guangzhou, China: A cross-sectional questionnaire study" explores an important yet underresearched topic of acculturation and mental health outcomes among China's rural to urban migrant youth.

Author's reply: Thank you very much for your understanding of the nuances and the public health significance of this manuscript.

1) First, the definitions of the study variables including social integration, psychological integration, and acculturation were not properly defined and distinguished given the closeness in meanings. Authors used social vs. psychological integration interchangeably but did not provide a strong theoretical basis

on why social integration encompasses and is represented by both psychological integration and acculturation (I assumed it is psychological acculturation at the individual level).

Author's reply: We appreciate the reviewer's points on our theoretical framework. The assimilation theory of migrants was first introduced by Park from Chicago school of sociology, which was defined as the process of interpenetration, integration and fusion between individuals or groups with different cultural background.¹ According to the theory, assimilation can be assessed from four types of accommodations including economic, political, social, and cultural. The theory was introduced and adapted in China as a "social integration theory" to study the domestic migrants focusing on their economic, cultural, and psychological integration.^{2,3} So, this was the theoretical foundation of the "social integration" in our study. On the other hand, other social integration theories had been only focused on social relationships without considerations on the acculturation.⁴ We have realized the concern of the applying the broad social integration theory in this paper given the limitation of data. Therefore, we deleted the descriptions of "social integration", and kept a straight forward analysis examine the association between acculturation and mental health. (p. 7, 1st-2nd paragraph)

References:

1. Park R E. Human Migration and the Marginal Man[J]. American Journal of Sociology, 1928, 33(6):881-893.
2. Yang J. From isolation, selection into the integration: thinking of theory of social integration of internal migrants. Population Studies. 2009;(01):17–29.
3. Yue Z, Li S, Feldman MW. Concept construction and Empirical Analysis of Social Integration for Rural-Urban Migrants in China. Modern Economic Science 2012(1):1-11.
4. Na L, Hample D. Psychological pathways from social integration to health: An examination of different demographic groups in Canada. SOC SCI MED 2016;151:196-205.

3) In this study, acculturation was studied as a single dimension variable which is similar to the concept of assimilation (adoption of culture in host city). The theory of acculturation (Berry, 2003) suggested that there are four possible states of acculturation including integration, assimilation, separation, and marginalization. Authors are advised to discuss why a single-dimension acculturation concept is adopted in this study.

Author's reply: We thank the reviewer's comment. Gordon described acculturation, or cultural and behavioral assimilation, as a phase of assimilation, which was the foundation of unidimensional acculturation theory.⁵ In this theory, individuals were placed on a continuum of identities ranging from exclusively heritage culture to exclusively mainstream culture. More recently, Berry put forward the bidimensional acculturation theory,⁶ which suggested that both heritage and mainstream cultural identities were free to vary independently, and acculturation strategies could be divided into four categories: separation, integration, assimilation, and marginalization.

Despite there were some evidences in favor of the bidimensional acculturation,⁷ the majority of self-report acculturation scales reflected a unidimensional framework in public health studies.⁸ Majority of these studies showed a linear relationship between acculturation and psychological distress was better demonstrated by the unidimensional model,⁹ while only a few studies show a curvilinear relationship which was better demonstrated by the bidimensional model.¹⁰ On the other hand, the measurement of unidimensional acculturation was simpler than that of bidimensional acculturation and convenient for young adolescents to understand in data collection process.⁷ Therefore, the unidimensional acculturation theory was adopted in this study. We have added these points in the study limitation and revised the method correspondingly (p. 11, 2nd paragraph).

References:

7. Ryder A G, Alden L E, Paulhus D L. Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self-identity, and adjustment.[J]. *Journal of Personality & Social Psychology*, 2000, 79(1):49-65.
8. Matsudaira T. Measures of psychological acculturation: A review[J]. *Transcultural psychiatry*, 2006, 43(3): 462-487.
9. Rogler L H, Cortes D E, Malgady R G. Acculturation and mental health status among Hispanics: Convergence and new directions for research[J]. *American Psychologist*, 1991, 46(6):585-97.
10. Adrados J L R. Acculturation: The Broader View. Theoretical Framework of the Acculturation Scales[J]. *International Journal of the Addictions*, 2015, 32(12-13):1919-1924.

4) The way psychological integration has been measured and conceptualized seems to be problematic . Integration usually refers to the adoption of both cultures (origin and host), the measuring construct of psychological integration is only focused on host city ("do you like guanzhou?" "are you satisfied with

your life in GZ?"). These questions seem to reflect an overall psychological adjustment rather than integration.

Author's reply: We agree with the reviewer and changed "psychological integration" into "psychological adjustment" after additional literature review.¹¹⁻¹³ We have revised the introduction and method correspondingly (p. 7, 2nd paragraph; p. 12, 2nd paragraph).

References:

11. Kim E, Cain K, McCubbin M. Maternal and paternal parenting, acculturation, and young adolescents' psychological adjustment in Korean American families[J]. *Journal of Child and Adolescent Psychiatric Nursing*, 2006, 19(3): 112-129.

12. Ward C, Kennedy A. Psychological and socio-cultural adjustment during cross-cultural transitions: A comparison of secondary students overseas and at home[J]. *International journal of psychology*, 1993, 28(2): 129-147.

13. Olasupo M O, Idemudia E S, Dimatkakso M. Adjustment, psychological well-being and mental health of first year students in a South African university[J]. *North American Journal of Psychology*, 2018, 20(1):55-68.

5) Authors did not provide enough theoretical justification relating to the pathway from acculturation to integration to mental health. Given the cross-sectional nature of the research, justifications for the mediation pathway should be spelled out as especially tight. A potential analytical strategy is to conduct alternative models with integration as a predictor and acculturation as a mediator and compare models using chi-square difference test.

Author's reply: We thank the reviewer pointing out this concern. We have supplemented the corresponding theoretical justification on the pathway from acculturation to psychological adjustment to mental health. In the revision, we conducted a sensitivity analysis followed the reviewer's advice to conduct alternative models with psychological adjustment as a predictor and acculturation as a mediator. Given the new acculturation dimensions on mental health were non-significant (figure 1), we did not add the alternative model in the manuscript so far.

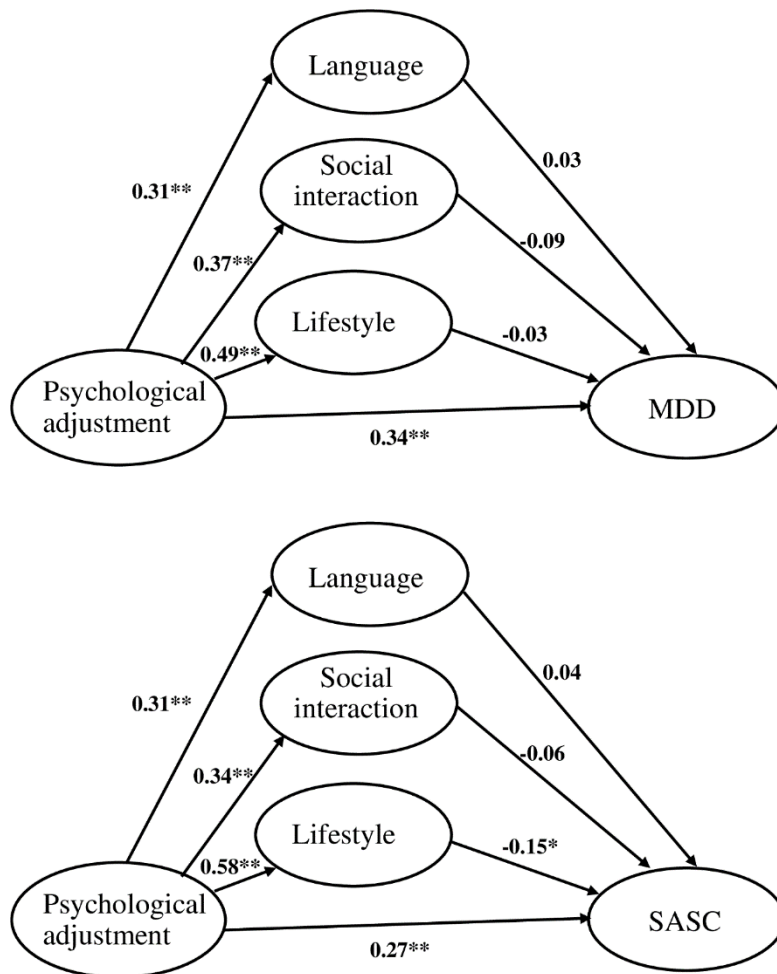


Figure 1. Structural equation models with psychological adjustment as predictor, acculturation dimensions as mediators and mental health as outcomes. Note: **:P<0.001; *:p<0.05; MDD: Major depression; SASC: Social Anxiety Scale for Children

6) In page 7, acculturation was reported to include three latent variables, but in the analysis, only three latent variables (language, customs, and social interactions) are shown, authors should have constructed a second-order CFA model for acculturation and include acculturation as a general latent variable in the final SEM .

Author's reply: We agree with the reviewer on a second-order CFA model for acculturation. The result of CFA model indicated that the measurement of acculturation had good construct validity (index: $P=0.129>0.05$, $CMIN/df=1.26$, $GFI=0.992$, $CFI=0.996$, $RMSEA=0.015$, See Figure 3 in the manuscript), however, correlation coefficients between acculturation dimensions were relative low (<0.6), which indicated that a second-order CFA was not necessary because second-order model did not make the model more concise when correlation coefficients between dimensions were low.¹⁴ Our primary goal here was to explore the impact of each acculturation dimension on mental health. Compared with a second-order model, the first-order CFA model shows the impacts of different acculturation dimensions

on the mental health in a more direct fashion. Therefore, we did not include the second-order CFA model.

References:

14. Fu H, Pan H, Kong D. Second order confirmatory factor model in AMOS. [J]. Chinese Journal of Health Statistics. 2013;30(1):52-6

7) Authors are advised to report the factor loadings of all measuring constructs of integration, acculturation and mental health outcomes (both depression and anxiety).

Author's reply: We agree with the reviewer and added the factor loadings of all measuring constructs. See Figure 1 and Figure 2 in the manuscript.

8) Authors are advised to report the descriptive, and normality index for depression and anxiety outcomes.

Author's reply: We agreed with the reviewer and added the normality index as appropriate. Unfortunately, the MDD scale has not been applied to Chinese adolescent before, so we have no normality index for depression, and we have stated this in the limitation section (p. 21, 2nd paragraph).

Reviewer #2s' Comments

I accept this paper with minor revision as document below

ABSTRACT

1) In article summary, the authors should discuss more on new knowledge from the study rather than showing study limitations. Thus the two last bullet points should be something related to policy recommendations.

Author's reply: We thank the reviewer to point out this comment. According to editor's suggestion, we would not revise the content in article summary.

INTRODUCTION

2) Please describe other risk factors that affect mental health, such as drug abuse, and parental mental health. If those variables do affect mental health, to what extent you incorporate them in the model (as

it seems that you use only participants' demographic data as the only covariates)

Author's reply: We thank the reviewer to point out this comment. We didn't include drug abuse of adolescent due to the prevalence was quite low (0.03-1.1%) among adolescents in China.^{15,16} We also cannot investigate the mental health status of parents due to the lacking of such measures in the survey. We have acknowledged this data limitation in the limitation section (p. 21, 2nd paragraph).

References:

15. Luo J, Yang F, Zhang C M. The epidemiological survey on substance among middle school students in Yunnan[J]. Chinese Journal of Drug Dependence, 2005, 14(3): 219-222.

16. Ji C Y. Adolescent health risk behaviors[J]. Chinese Journal of School Health, 2007, 28(4):289-291.

3) What is the proportion of internal migrants who are not (and are not) in schools in the Guangzhou? Such data will provide a useful insights of the participant representativeness.

Author's reply: We thank the reviewer to point out this comment. Previous study showed that 95% of migrant adolescents in Guangdong province were enrolled in school.¹⁷ Due to the lack of registration of migrant adolescent in Guangzhou, we don't have better ways to specifically verify the representativeness of the samples. Thanks to the reviewer's comment, we added the proportion of internal migrants who are in schools in method section of the revised manuscript (p. 9, 1st paragraph).

References:

17. Zhou H, Qu Z Y, Zhang Q L. Survey on the development and needs of migrant children in nine cities of China[J]. Youth Studies, 2005(2):1-7.

METHODS

4) Have you calculated the sample size? If so, please describe the formula behind. If not, at least you should mention this point in the discussion section.

Author's reply: We have estimated the sample size for the primary analysis. There were 35 variables in this study. At least 350 samples would met the requirement for multivariable analysis which should be ten times more than the number of variables.¹⁸ We have add this content in the discussion section correspondingly (p. 17, 2nd paragraph).

References:

18. Tanaka J S. "How Big Is Big Enough?": Sample Size and Goodness of Fit in Structural Equation Models with Latent Variables[J]. *Child Development*, 1987, 58(1):134-146.

5) As per your inclusion criteria, a student would be included if one of his/her parents did not have hukou. If so, it means that your results cannot claim that the association between MDD/Anxiety and social integration is 'unique' amongst internal migrants. If you have data of students where both parents have hukou, this might be super useful as this population can be used as comparison group. If not, you should mention this as a key limitation.

Author's reply: We thank the reviewer to point out this comment. According to China's hukou policy, a child's hukou must be with one of the parents, which means for migrant adolescents, at least one of their parents do not have local hukou. Local adolescents (both parents have hukou) do not have acculturation problems, and were not included in our study.

RESULTS

6) Please add a table summarizing degree of direct and indirect effects of all variables from the SEM as well as their 95% CI (though you have already shown these in Fig 2-3).

Author's reply: We thank the reviewer to point out this comment. We have added this content in table 4 (p. 37).

7) I guess that most of the parameters are not normally distributed, therefore showing median and interquartile range might be useful.

Author's reply: We thank the reviewer to point out this comment. We found these parameters were normally distributed in our descriptive analysis. We have shown the mean and standard deviation of the parameters.

DISCUSSION

8) It is better to divide the discussion part into subsections, namely, result discussion, methodological discussion, and policy recommendations.

Author's reply: We have revised the Discussion section accordingly.

9) You attempt to explain why customs lead to negative effect on anxiety through Berry's theory. I am not totally convinced in this explanation. If it appears as what you mention, those who become familiar with the customs should be less anxious while the negative effect should be present amongst those who are in the process of integrating with the new customs. Therefore you should have extra-analysis to back up this assumption. Say subgroup analysis between those with longer stay and those with short stay in the study area.

Author's reply: We thank the reviewer to point out this comment. As our responses to Reviewer 1's 2nd comment, we designed the acculturation measurement based on the unidimensional acculturation theory. Therefore, the response to acculturation could only indicate exclusion or acceptance to the hosting society, and could not indicate preservation or abandonment of the heritage culture. We do not intent to explain the problem through Berry's theory in this situation and switched to other appropriate literatures to explain this problem (p. 19, 1st paragraph). We also found that there was no significant difference in acculturation between migrants who lived longer and those who lived shorter. We revised the manuscript accordingly.

Minor comments

In intro part

10) Please describe the definitions of several terms like 'acculturation', 'customs', 'social integration'—to name a few. This will help audiences who are not familiar with this field to better know the study objectives.

Author's reply: We have simplified the variables as suggested by the first reviewer. (p. 7, 2nd paragraph; p. 12, 1st paragraph)

In methods part

11) Though you use purposive sampling on schools, please describe the rationale behind the selection (purposive by what?)

Author's reply: We thank the reviewer to point out this comment. These private schools include both local adolescents and migrant adolescents. According to our research purposes, we select schools with higher proportion of migrant adolescents to ensure adequate number of samples. We have revised this

part in method section. (p. 9, 1st paragraph)

In results part,

12) Please add descriptive data of custom in percentage of participants rather than saying 'majority' (page 13, line 11-16)

Author's reply: We have revised accordingly.

13) In the issue 'know the local language well', please describe how you measure the level of proficiency of participants (page 13, line 18-21)

Author's reply: We used the survey questions such as "Can you understand Cantonese?" and "Can you speak Cantonese?" to measure the language ability. If the answer was "Completely" or "Most", we then categorize the language ability of participant as good. We realized this statement "know the local language" can be ambiguous, and have changed it to "could understand or speak local language".

In discussion part

14) Please detail more about Berry's theory and the findings from other studies page 18, line 9)

Author's reply: We thank the reviewer to point out this comment. We ended up using Berry's theory for the design of the acculturation measurement. We have supplemented the findings from other studies which based on the unidimensional acculturation theory to explain our results (p. 19, 1st paragraph).

VERSION 2 – REVIEW

REVIEWER	Rapeepong Suphanchaimat International Health Policy Program, Ministry of Public Health, Thailand
REVIEW RETURNED	28-Sep-2018
GENERAL COMMENTS	I think it is OK to publish now. The paper provides sound methodological presentation and good explanation towards relationship between acculturation and mental health. One minor point as this study shows acculturation problem among students whose at least one parent did not have hukou, there are no students whose both parents did not have hukou. In other words, there is no comparison group. So I think avoid saying that the acculturation problem is 'unique' among 'all' migrants. But I will leave this point to authors' discretion.

VERSION 2 – AUTHOR RESPONSE

Reviewer: 2

Reviewer Name: Rapeepong Suphanchaimat

Institution and Country: International Health Policy Program, Ministry of Public Health, Thailand

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

I think it is OK to publish now. The paper provides sound methodological presentation and good explanation towards relationship between acculturation and mental health. One minor point as this study shows acculturation problem among students whose at least one parent did not have hukou, there are no students whose both parents did not have hukou. In other words, there is no comparison group. So I think avoid saying that the acculturation problem is 'unique' among 'all' migrants. But I will leave this point to authors' discretion.

Author's reply: Thank you very much for your understanding of the public health significance of this manuscript. In fact, one of this study inclusion criteria was at least one of the students' parent did not have hukou in Guangzhou. Thus, the students whose both parents did not have hukou were included indeed. Since acculturation is a concept specifically aimed at immigrants, and local adolescents (both parents have hukou) do not have acculturation problems, so they were not included in our study as comparison group. We would like to maintain the existing content without revision.