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.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Different predictors of pain severity across age and gender of a Chinese rural population : a cross-sectional survey
AUTHORS	Liu, Xiao-kun; Xiao, Shuiyuan; Zhou, Liang; Hu, Mi; Liu, Hui-ming

VERSION 1 – REVIEW

REVIEWER	Richard Nahin National Institutes of Health, USA
REVIEW RETURNED	19-Jan-2018

GENERAL COMMENTS	This study has both strengths and weaknesses. However, most of the weaknesses are based on lack of methodological detail and can be easily address. The weakest part of the article is the Discussion, which needs to be substantially modified as detailed below. Strengths Well written. Excellent rational for the study. Survey methodology appears excellent. Use of several well validated scales. Results clearly (for the most part) presented. Weaknesses Lack of justification for limiting the survey to a single rural county in China. At a minimum, the authors should provide evidence that this county is representative of all rural counties in China. Within out this demonstration, the authors cannot generalize their finding to other rural counties in China. Measurement of pain. Some justification must be given for the choice of measuring 4-week pain prevalence, especially since most of the pain literature cited by the authors measured 3 month (or more) prevalence rates of pain. Lack of any discussion concerning study limitations – all surveys have limitations that should be discussed in the context of the specific study - e.g. generalizability, cross-sectional, validity of self-reported data, recall bias, etc. In the Discussion, the authors compare their data to other studies internationally. The authors conclude that the higher pain prevalence rate observed in their sample results from sample characteristics such as poorer SES. While this may be true (and the authors would need to better describe demographic differences between their study and the cited literature), an equally likely reason the current data varies from the published data is that very different measures of pain were used. For instance, the cited studies examined chronic pain (pain lasting 3 months or more). It is highly likely this definition would produce substantially lower prevalence rates than simply asking if

someone had any pain in the last 4 weeks. In fact, the paper from Canada (Schopflocher et al) illustrates how increasing more stringent definitions of pain resulted in substantially lower prevalence rates. Surprisingly, while the authors mention two previous pain surveys in China, they don't compare directly the data and design of these previous pain surveys to their own data. This is the more meaningful comparison relative to discuss the impact of rural vs. urban environments and SES on pain prevalence then data collected in different countries.

Minor points
Why was forward regression used in the logistic analysis, but stepwise regression used in the linear analysis? What were the parameters for adding independent variables to the model – e.g., alpha for entering model, alpha for staying in model.

The authors need to define whey they mean by rural – I assume population density but based on their description of the Liuyang County could be agricultural vs. industrial.

It is not clear why the authors ran 3 separate linear regression models, one for each age group, rather than including age as an interaction term in a regression model suing the full survey sample (e.g., age*physical heath, age*mental health, etc.).

Table 1 only provides data on a partial list of independent variables. I would like to see demographic breakdown of each variable that was considered for either the logistic or linear regression models

It is assumed the date presented under section 3.3 and 3.4, and in tables 3 and 4 are adjusted odds ratio, but this is not stated.

REVIEWER	Reino Pöyhiä
	Kauniala Hospital, University of Helsinki, Finland
REVIEW RETURNED	29-Jan-2018

GENERAL COMMENTS	The MS bmdjopen-2017-020938 is a report of cross-sectional study about the prevalence and risk factors of experienced pain in adult Chinese individuals in rural areas of Liuyang. A random sample of 2052 inhabitants were interviewed using nationally and internationally validated tools inquiring reported healths status, depression, anxiety, self-efficacy, pain intensity and perceived stress over a 4-wk period. University students performed the interviews The average prevalence of pain was reported 66.18 %. Female gender, age and depression was associated with more pain. In addition, psychosocial factors and physical condition was connected to experienced pain in young males and elder individuals, respectively. Males and females responded differently to questions asking socioeconomic status, self-efficacy and physical health. The methods are well-chosen, the study is straightforwardly executed and the paper is nicely written. The results differ from few other previous studies reporting the prevalence of pain being 10-40 % (Wang et al. Public Health 2015, Volin et al Spine 2016, Zhang et al. BMC Musculoskel Dis 2015). The previous studies have focused to specific etiologies ("low back pain") or populations ("students"). Obviously the major flaw of the present study is the lack of specificity of "pain". Although the number of epidemiologic studies in pain is not overwhelmingly large in China, the meaning of general prevalence of what-so-ever pain remains obscure. In addition, below there are more specific concerns, which the

	authors should respond:
	1) is the sample size representative, was it based on power analysis?
	2) why no distinction was made between short- and long-term pain? Can this be done in China using validated and translated questionnaires?
	3) are the cities of Gaoping and Young´an and villages similar or dissimilar in respect of social structure (urbanization, employment status, wealth), public health and health care services?
	4) did the authors investigate the significance of interviewer on the results?
	Yet, the report is interesting and shows similarities across the borders in experienced pain.

REVIEWER	Vasiliki Sakellari
	Technological Educational Institute of Sterea Ellada, Greece
REVIEW RETURNED	02-Feb-2018

GENERAL COMMENTS	This study showed strong associations that can provide deeper understanding of the way to develop models of good practice to eliminate pain incidences.

VERSION 1 – AUTHOR RESPONSE

Point-to-point responses

Editor Comments to Author:

1. Please include the study design in the title.

    Thanks for the guidance from the editors and the title had been changed. The study design has been added to the title.

2. Please discuss the limitations of the study in the discussion section.

    Thanks for the suggestion and the limitations of this study have been supplemented.

3. Please remove your figure in your main document and upload separately under file designation 'Image' (except tables and please ensure that Figures is of better quality or not pix-elated when zoom in). NOTE: It can be in TIFF or JPG format and make sure that it has a resolution of at least 300 dpi. Figures in PDF, DOCUMENT, EXCEL and POWER POINT format are not acceptable.

    Thanks for the reminding and all the figures will be uploaded separately as image.

Reviewer: 1

1. Lack of justification for limiting the survey to a single rural county in China. At a minimum, the authors should provide evidence that this county is representative of all rural counties in China.

Within out this demonstration, the authors cannot generalize their finding to other rural counties in China.

Liuyang is a representative rural city of the Hunan province. Rural towns in Liuyang are similar in respect of geography, population sizes, gender and age distributions, social structure, public health and health care services, so that residents in these rural towns are comparable.

2. Measurement of pain. Some justification must be given for the choice of measuring 4-week pain prevalence, especially since most of the pain literature cited by the authors measured 3 month (or more) prevalence rates of pain.

    Most studies in the field of pain reported pain experience in a period of three months to one year. We measured a 4-week period prevalence of pain experience based on two considerations: (1) to find the "current pain" which may need to deal with; (2) to decrease recall bias which are unpreventable for reporting pain experience in a longer period.

3. Lack of any discussion concerning study limitations – all surveys have limitations that should be discussed in the context of the specific study - e.g. generalizability, cross-sectional, validity of self-reported data, recall bias, etc.

    Thanks for the reminding and the limitation part has been added.

4. In the Discussion, the authors compare their data to other studies internationally. The authors conclude that the higher pain prevalence rate observed in their sample results from sample characteristics such as poorer SES. While this may be true (and the authors would need to better describe demographic differences between their study and the cited literature), an equally likely reason the current data varies from the published data is that very different measures of pain were used. For instance, the cited studies examined chronic pain (pain lasting 3 months or more). It is highly likely this definition would produce substantially lower prevalence rates than simply asking if someone had any pain in the last 4 weeks. In fact, the paper from Canada (Schopflocher et al) illustrates how increasing more stringent definitions of pain resulted in substantially lower prevalence rates. Surprisingly, while the authors mention two previous pain surveys in China, they don't compare directly the data and design of these previous pain surveys to their own data. This is the more meaningful comparison relative to discuss the impact of rural vs. urban environments and SES on pain prevalence then data collected in different countries.

    Thanks for the constructive suggestion and this part has been revised.

5. Why was forward regression used in the logistic analysis, but stepwise regression used in the linear analysis? What were the parameters for adding independent variables to the model – e.g., alpha for entering model, alpha for staying in model.

    Stepwise regression models have been replaced by the new models and tables.

6. The authors need to define whey they mean by rural – I assume population density but based on their description of the Liuyang County could be agricultural vs. industrial.

    The current household registration system (known as the Hukou System) implemented in China divides the residents into agricultural and non-agricultural residencies and established a rural-urban division. A household registration record officially identifies a person as a resident to be rural or urban according to the inheritance and geographic location. Rural areas are less developed in many ways, compared with urban areas, such as infrastructure, education and health care.

7. It is not clear why the authors ran 3 separate linear regression models, one for each age group, rather than including age as an interaction term in a regression model suing the full survey sample (e.g., age*physical heath, age*mental health, etc.).

    All the separate linear regression models have been replaced by the new general linear model and all the interactions of age, gender with other predictors were included in the new regression model. Any interactions found between age, gender and another predictor was further studied using simple effect tests.

8. Table 1 only provides data on a partial list of independent variables. I would like to see demographic breakdown of each variable that was considered for either the logistic or linear regression models

    The descriptive information of each variable was added.

9. It is assumed the date presented under section 3.3 and 3.4, and in tables 3 and 4 are adjusted odds ratio, but this is not stated.

    Thanks for the reminding. Both the crude odds ratios and adjusted odds ratio have been represented in the revised edition. The crude odds ratio may be adjusted for confounding factors in real life situation and get the adjusted odds ratios.

Reviewer: 2

10. Is the sample size representative, was it based on power analysis?

The sample is representative.

11. Why no distinction was made between short- and long-term pain? Can this be done in China using validated and translated questionnaires?

We measured a 4-week period prevalence of pain experience based on two considerations: (1) to find the "current pain" which may need to deal with; (2) to decrease recall bias which are unpreventable for reporting pain experience in a longer period. However, as our reviewer correctly pointed out, we did not distinguish short- and long-term pain. The primary propose of our study is to reported pain experience of the sample, which may need to be dealt with. In further study, we need to use more accurate study design and instruments to describe details of pain experiences among the rural population, as suggested. Thanks.

12. Are the cities of Gaoping and Young´an and villages similar or dissimilar in respect of social structure (urbanization, employment status, wealth), public health and health care services?

Rural towns in Liuyang are similar in respect of geography, population sizes, gender and age distributions, social structure, public health and health care services, so that residents in these rural towns are comparable.

13. Did the authors investigate the significance of interviewer on the results?

All interviewers received a 2-day uniform formal training so that they could administer the interviewing with the same standard.

Reviewer: 3

14. This study showed strong associations that can provide deeper understanding of the way to develop models of good practice to eliminate pain incidences.

Thanks for your remarks.

VERSION 2 – REVIEW

REVIEWER	Richard L. Nahin National Institutes of Health, USA
REVIEW RETURNED	30-Mar-2018

GENERAL COMMENTS	The authors have done a commendable job addressing review concerns.