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)	The Effect of Family Practice Contract Services on the Quality of Primary Care in Guangzhou, China: A cross-sectional study using PCAT-AE
AUTHORS	Li, Lina; Zhong, Chenwen; Mei, Jie; Liang, Yuan; Li, Li; Kuang, Li

VERSION 1 – REVIEW

REVIEWER	Assistant Prof. Dr. Nithra Kitreerawutiwong Faculty of Public Health, Naresuan University, Thailand
REVIEW RETURNED	27-Feb-2018

GENERAL COMMENTS	Suggestion for the manuscript The Effect of Family Practice Contract Services on the Quality of Primary Care in Guangzhou, China – A cross-sectional study using PCAT-AE This paper is useful to be an input for improvement of primary care. However, it will be clarify when the revision will be completed. 1. In the abstract, conclusion part the domain of “first contact” did no t relevant with the result. 2. The limitation (p.4) regarding the sample size. If the sample size was calculated to minimize bias and error, the number of sample was acceptable. The limitation should be the system context of primary care services of this area, that will be explain. 3. P.5 , line5 Please described - what is an individual primary care physician. For example public or private facility or private solo clinics need to be explained. 4. P.5, line 7, What is other physicians means? Due to this sentence compare the facility type between an individual PCP and other physicians. 5. P.6, line 33, n 2018, what is the coverage of this family practice system such as 60%, 70% or ....? 6. P.6, line 42, Why the awarded was determined in range? What is the criterion in defining the money? What is the maximum of registered patients of each PCP facility? 7. P. 7, line 52, What does it means "one of the first"? 8. P.7, line 62-63, What is the difference between primary care physician (PCP) and general practitioner? Is the CHC in Guangzhou have the permanent primary care physician (PCP)? How many CHCs in Guangzhou? 9. P.8, line 66-67, Please citation, due to identify "studies" = more than one study. 10. P.8, line 78, What is the gap of evaluating of quality of primary care in this area? 11. P.8, line 83, How many primary care facilities of this study? How did the author come up with the sample size and sampling technique used? 12. P.8, line 85, How many research assistants?

	13. P.9, line 88, Explain the pilot test that the author conducted. 14. P.9, line 89, How many items that was left? 15. P. 9, line 91, Why the age were over 16 years old not 18 years old or 20 years old? Is the basic health services cover immunization? If include how did the authors achieve this services such as interview the parent or guardian? 16. P.9, line 92, How many sites? 17. P.9, line 94, Added exclusion criterion. 18. P. 10, line 120, Why did the author assigned "do not know" to be 2.5 not 0? 19. P. 10, line 124, How many completed questionnaire? 20. P. 10, line 126-128, Why did the author consider these variables are confounder? 21. P. 11, Line 131-132, Which type of t-test? What is the level of significance? 22. P. 18, line 255, Added the previous research to discuss the findings. 23. P. 18, line 263-264, Give the reason to support the discussion such as when consider on each item, this item "medical record" got the lower score? 24. P. 19, reconsider, the limitation line 281, How did the author come up with the sample size? If the error (type1, type2 error) was reduced, it was acceptable. 25. P. 19, line 284-285, Reconsider, is it a limitation? Because the previous study with the paradigm of positivism, it is acceptable.

REVIEWER	Lixin Jiang Fuwai Hospital, CAMS&PUMC, National Center for Cardiovascular Diseases, China
REVIEW RETURNED	09-Mar-2018

GENERAL COMMENTS	Manuscript Number: BMJOPEN-2017-021317 Title: The Effect of Family Practice Contract Services on the Quality of Primary Care in Guangzhou, China – A cross-sectional study using PCAT-AE This article compared the perceived quality of primary care between patients with and without a family primary care physician. In the analysis based on propensity score match, the study showed that family primary care services are related to a higher total PCAT score, but the difference varied across domains of PCAT. This is a relevant study, but the article can be substantially improved by providing necessary detailed information and reorganizing in accordance with the STROBE. I have several major comments below. Major comments: 1. The Introduction section can be substantially shortened. The essential messages in this section should include: why this is an important topic; what are the gaps of knowledge on this topic; why the current study can address these gaps – other information like some policy background can be moved to the Discussion section or the appendix. 2. To understand the challenges for primary care system in China, a recent national survey on primary care published in the Lancet could be helpful (Li X, the Lancet, 2017;390:2584-2594) 3. Page 7, Line 49, “10 representative cities”, methodologically, only random sample can be considered representative. 4. I knew that there were validated Chinese version of PCAT before? If the authors used the version validated by others, please site the prior study. If the authors did the validation by themselves, the details of the relevant methods and results are necessary, please

	elucidate in the appendix. 5. How many sites have been included in Guangzhou in the current study, and how were they selected? 6. Please provide more detailed methodological information about the patient sampling 7. Page 9, Line 94, “at least three times”, in a year or totally? Why three times – it seems a little arbitrary. 8. Please check the STROBE carefully to ensure all important information is included, like how the sample size was determined, what was the response rate, what was the missing rate, what are the potential biases? 9. More information about PSM methods used in the current study, including detailed parameters 10. Page 18, Line 250, “The family practice contract service encourages doctors to improve the efficacy and comprehensiveness of primary care services, including providing periodic health assessments, promoting the early detection of and follow-up consultations for chronic conditions, home care services and traditional Chinese medicine.” Is this based on a finding from the current study or prior evidence? 11. Please What are the political or clinical implications of the current study? Minor comments 1. Please provide numbers, including proportions, means, p values, in the Results section of the Abstract. 2. Please state the significance of comparisons in the text of the Results section, like the p values, 95% confidence intervals, and the standard deviations. 3. Had this study been approved by the IRB? If so, please clarify that in the Methods section. 4. The Table 2 and Figure 3 can be combined, since they provided similar information.

VERSION 1 – AUTHOR RESPONSE

Comments from the reviewers:

Reviewer: 1
This paper is useful to be an input for improvement of primary care. However, it will be clarify when the revision will be completed.
1. In the abstract, conclusion part the domain of “first contact” did not relevant with the result.
Response:
We thank the reviewer for the constructive suggestion. We have now added results of first contact domain in the abstract section. “… the scores in the first contact utilization domain (2.74 vs 2.87, P=0.14) and coordination domain (1.76 vs. 1.93, P＜0.05) were lower among patients who contracted a GP than in those who did not.” (P. 2)

2. The limitation (p.4) regarding the sample size. If the sample size was calculated to minimize bias and error, the number of sample was acceptable. The limitation should be the system context of primary care services of this area, that will be explain.
Response:
The data in our study were collected from the city of Guangzhou. We agree with the reviewer that this could limit the generalizability of the results to other regions of the country. We have now clarified this in the limitation section. (P. 3)

3. P.5, line5 Please described - what is an individual primary care physician. For example public or private facility or private solo clinics need to be explained.
Response:
We thank the reviewer for pointing the confusion arising from the use of “individual primary care physician”. We have now replaced “primary care physician (PCP)” by “general practitioner (GP)” in the body of text. Patients may receive primary care from GPs who may work in the public or private facility or private solo clinics.

4. P.5, line 7, What is other physicians means? Due to this sentence compare the facility type between an individual PCP and other physicians.
Response:
We again apologize for the confusion in the use of ‘Other Physicians’. By “Other physicians’ we mean non-GPs physician. Further, we do not intend to compare the facility type. We have now revised the manuscript as “Evidence has shown that reported quality of care is higher for GPs than that for non-GPs”. (P.4, line 6)

5. P.6, line 33, in 2018, what is the coverage of this family practice system such as 60%, 70% or ....?
Response:
We have now clarified it as “The State Council issued the Guidance on Establishing a General Practitioners System in 2011 and Guidance on the Promotion of Family Practice Contract Services in 2016, as well as plans to extend family practice contract services to the entire population by 2020.” (P.5, line 30-32)
The coverage of Family Practice Contract Services varies from place to place in China depending on the local primary care systems. For example, the coverage of family practice contract services is 65% in Shanghai reported for 2016[1], but only 33% in Guangzhou by the end of 2017[2].

6. P.6, line 42, Why the awarded was determined in range? What is the criterion in defining the money? What is the maximum of registered patients of each PCP facility?
Response:
The criterion for defining the awards vary in different CHCs. In addition to the number of patients contracted, GPs may receive additional awards depending on the standardized rate of chronic diseases management (in particular, such as diabetes and hypertension), and the satisfaction of contracted patients. We have added clarification in the Introduction section. (P.5, line 38-41).
Published study suggest that the optimal ratio of general practitioner to population shall be 1:2000. [3] However, there is no definitive stipulation of the maximum of registered patients for each GP in Guangzhou, likely due to the developing nature of the program in Guangzhou.

7. P. 7, line 52, What does it means "one of the first"?
Response:
Thanks for your comments. We have now clarified it as “one of the first batch of pilot cities” in the revised version. (P.6, line 45)

8. P.7, line 62-63, What is the difference between primary care physician (PCP) and general practitioner? Is the CHC in Guangzhou have the permanent primary care physician (PCP)? How many CHCs in Guangzhou?
Response:
For clarification, we have now replaced primary care physician (PCP) by general practitioner (GP) throughout the body of text.
In the United States, primary care physicians include general practitioners, family physicians, pediatricians and general internists. In China, general practitioners specially refer to physicians who have obtained the qualification certificate of the general practitioner, and they may practice in primary

care organizations, secondary or tertiary hospitals. Our study has focused on GPs in the community health centers.
There are 154 CHCs in Guangzhou in 2016.[4]

9. P.8, line 66-67, Please citation, due to identify "studies" = more than one study.
Response:
We thank the reviewer for the comment. Specification has been added in the Introduction section. "Previous evaluations of the family practice contract services have focused on…" (P.6, line 53-58)

10. P.8, line 78, What is the gap of evaluating of quality of primary care in this area?
Response:
Previous evaluation of the family practice contract services have focused on the number of contracted patients, the patient's awareness, service utilization and patient satisfaction.[1, 5] Du Z and Kuang L compared the perceived quality of primary care between patients with and without a usual source of care (USC), and found that patients with a USC reported higher quality of primary care experience compared with those without a USC.[6, 7] However, we are not aware of any study conducted in China that evaluates the process quality of primary care for family doctor contract services. The objective of this study is to fill this gap. Specification has been added in the Introduction section. (P.6, line 53-62)

11. P.8, line 83, How many primary care facilities of this study? How did the author come up with the sample size and sampling technique used?
Response:
Three CHCs were selected for data collection. More detailed information about sampling and sample size calculation were added in the Method section. (P.7, line 66-74)

12. P.8, line 85, How many research assistants?
Response:
The interviewers were four postgraduate students. Correction has been made in the revised version. (P.7, line 76)

13. P.9, line 88, Explain the pilot test that the author conducted.
Response:
The pilot test, which focused on item wording, was conducted in three CHCs in Guangzhou. The details about the pilot were added in the Method section (P. 8, Line 98-101)

14. P.9, line 89, How many items that was left blank?
Response:
Two items were left blank by most of the interviewees, these are: "Does your GP know what problems are most important to you?" and "Has your doctor asked about illness or problems that might run in your family?" respectively.

15. P. 9, line 91, Why the age were over 16 years old not 18 years old or 20 years old? Is the basic health services cover immunization? If include how did the authors achieve this services such as interview the parent or guardian?
Response:
We apologize for the clerical error and the typo. We have now corrected the error. We clarify that our study focuses on the quality of primary care for adults (i.e., all patients are 18 years or older). We have now also added inclusion and exclusion criteria of participants in the revised manuscript. (P.7-8, line 84-91)

16. P.9, line 92, How many sites?

Response:
We selected three CHCs in Guangzhou city for data collection. More detailed information about sampling were added in the Method section. (P.7, line 67-72)

17. P.9, line 94, Added exclusion criterion.
Response:
Considering the reviewer's suggestion, we have added exclusion criterion of participants in the Method section. (P.7-8, Line 88-91) "The exclusion criteria were as followed: 1) patients who were in poor physical condition and could not complete the survey, or 2) patients who could not understand the content of questionnaire."

18. P. 10, line 120, Why did the author assigned "do not know" to be 2.5 not 0?
Response:
The option "do not know / not sure" was assigned a value of 2.5 to be consistent with the same kind of researches used PCAT in other countries.[8, 9] Clarification has been made in the revised version. (P.9, Line 113-114)

19. P. 10, line 124, How many completed questionnaire?
Response:
Six hundred and ninety-eight (698) patients completed questionnaires. A total of 692 effective samples were included for data analysis. We have added relevant information in the revised version. (P.9, Line 116-118)

20. P. 10, line 126-128, Why did the author consider these variables are confounder?
Response:
Previous studies have shown that PCAT score was significantly influenced by demographic and socio-economic characteristics, health status and service utilization of patients.[6, 7, 10] We have adjusted these factors in our analysis.

21. P. 11, Line 131-132, Which type of t-test? What is the level of significance?
Response:
We performed independent samples t-test. The level of significance was $p < 0.05$. We have clarified this in Method section. (P.9, Line 130-132)

22. P. 18, line 255, Added the previous research to discuss the findings about family-centred care.
Response:
We thank the reviewer for this suggestion. We have clarified in the Discussion section. (P.15, Line 229-235)

23. P. 18, line 263-264, Give the reason to support the discussion such as when consider on each item, this item "medical record" got the lower score?
Response:
Clarification has been added in the Discussion section (P.16, Line 254-263). "On the other hand, the score in the coordination domain (1.76 vs. 1.93, $P < 0.05$) were lower among patients who contracted a GP than in those who did not. We then compared the items under the domain of coordination of care, found that the medical record item "Did your GP write down any information for the specialist about the reason for the visit?" (2.55 vs. 3.05, $P < 0.01$) reported significantly lower score among patients who contracted a GP than in those who did not. The lower score could be explained by the fact that there was no specific medical record (referral letter) for the physicians to use to refer the patients to another care service provider in China primary care practice.[11] Instead, referrals were mostly done by oral notification of referral information, or by directly informing the accepting provider

about patient's condition by phone by the referring GP."

24. P. 19, reconsider, the limitation line 281, How did the author come up with the sample size? If the error (type1, type2 error) was reduced, it was acceptable.
Response:
See response above. We have added clarification in the limitation section. (P. 17, Line 278)

25. P. 19, line 284-285, Reconsider, "only quantitative analyses were conducted in this study" is it a limitation? Because the previous study with the paradigm of positivism, it is acceptable.
Response:
It is really true as Reviewer suggested that "only quantitative analyses were conducted in this study" is not a limitation, and we have adjusted this part. (P. 17, Line 280-282)

Reviewer: 2
This article compared the perceived quality of primary care between patients with and without a family primary care physician. In the analysis based on propensity score match, the study showed that family primary care services are related to a higher total PCAT score, but the difference varied across domains of PCAT. This is a relevant study, but the article can be substantially improved by providing necessary detailed information and reorganizing in accordance with the STROBE. I have several major comments below.

Major comments:

1. The Introduction section can be substantially shortened. The essential messages in this section should include: why this is an important topic; what are the gaps of knowledge on this topic; why the current study can address these gaps – other information like some policy background can be moved to the Discussion section or the appendix.
Response:
We thank the reviewer for the instructive suggestions. We have revised this part accordingly and moved some information about policy background to the Discussion section. (P. 15-16, Line 246-252)

2. To understand the challenges for primary care system in China, a recent national survey on primary care published in the Lancet could be helpful (Li X, the Lancet, 2017;390:2584-2594)
Response:
We thank the reviewer for the recommendation. Indeed, the study by Li X et al was extremely informative. It highlights issues of primary care development in China. We have added citation in the revised manuscript. (P.4, line 13)

3. Page 7, Line 49, "10 representative cities", methodologically, only random sample can be considered representative.
Response:
We have now replaced "10 representative cities" by "10 model cities" in the revised version. (P.5, line 42)

4. I knew that there were validated Chinese version of PCAT before. If the authors used the version validated by others, please site the prior study. If the authors did the validation by themselves, the details of the relevant methods and results are necessary, please elucidate in the appendix.
Response:
Thank you for the suggestion and we have now cited prior study that validated Chinese version of PCAT. (P.8, line 94). In addition, we conducted a pilot test which focused on item wording in three CHCs in Guangzhou. More details were added in the Method section. (P. 8, Line 98-101)

5. How many sites have been included in Guangzhou in the current study, and how were they selected?
Response:
We selected three CHCs for collecting data. More detailed information about sampling was added in the Method section. (P.7, Line 67-72)

6. Please provide more detailed methodological information about the patient sampling
Response:
We have now added more detailed methodological information about the patient sampling in the Method section in the revised manuscript. (P.7, Line 67-72; P.7-8, Line 84-91)

7. Page 9, Line 94, “at least three times”, in a year or totally? Why three times – it seems a little arbitrary.
Response:
We selected patients who had visited the same CHC at least three times in the last year. We believe these patients have a better understanding of the primary care services provided by general practitioners, based on previous studies.[12] (P.7-8, Line 86-88)

8. Please check the STROBE carefully to ensure all important information is included, like how the sample size was determined, what was the response rate, what was the missing rate, what are the potential biases?
Response:
We thank the reviewer for the suggestion and we have now included this in the Method section. (P.7, Line 67-74; P.9, Line 116-118) The potential bias is that patients who had experienced higher quality of primary care were more willing to sign contracts with GPs, which may bias the results. (P.17, Line 280-282)

9. More information about PSM methods used in the current study, including detailed parameters
Response:
We have now added more information about PSM method in the Method section in the revised manuscript. (P.9, Line 118-125) “PSM were employed through a nearest neighbor matching algorithm with a match tolerance of 0.1. After PSM, a total of 94 patients in the contracted a GP group were matched with 94 patients in the no contracted a GP group.”

10. Page 18, Line 250, “The family practice contract service encourages doctors to improve the efficacy and comprehensiveness of primary care services, including providing periodic health assessments, promoting the early detection of and follow-up consultations for chronic conditions, home care services and traditional Chinese medicine.” Is this based on a finding from the current study or prior evidence?
Response:
Thanks for your comments. It is based on the policy requirement of Family Practice Contract Services in China. GPs who contracting with patients were required to provide a range of primary care service (periodic health assessments, promoting the early detection of and follow-up consultations for chronic conditions, etc.) for patients who contracted with them, which may be part of the reasons for the higher comprehensiveness score of patients with contracted GP. We have clarified this in the revised manuscript (P.15, Line 236-243)

11. Please What are the political or clinical implications of the current study?
Response:
Our findings demonstrated that patients who had a contracted GP tend to experience higher quality of primary care, which provided evidence for policies to promote the implementation of family practice contract services. Further efforts should place emphases on the strength of the features of primary

care, especially first contact and coordination services. The government should continue putting efforts into establishing the family practice system and strengthen primary care, especially in the context of an aging population and increasing prevalence of chronic diseases. We have added these for clarification. (P.17, Line 282-292)

Minor comments

1. Please provide numbers, including proportions, means, p values, in the Results section of the Abstract.
Response:
We thank the editor for the suggestion and we have now added relevant quantitative results in the abstract. (P. 2)

2. Please state the significance of comparisons in the text of the Results section, like the p values, 95% confidence intervals, and the standard deviations.
Response:
We thank the editor for the suggestion and we have now added the significance of comparisons in the text of the Results section (P. 10-13)

3. Had this study been approved by the IRB? If so, please clarify that in the Methods section.
Response:
Yes, we have obtained an ethical approval from the Institutional Review Board of the School of Public Health, Sun Yat-Sen University, P.R. China. Clarification have been added in the Methods section. (P.7, Line 79-81)

4. The Table 2 and Figure 3 can be combined, since they provided similar information.
Response:
Thanks for your comments. We have combined Table 2 and figure 3 and generated a new version of Figure 2.

References:
[1]. Bao-hua, Q., et al., A comparative study on the health services utilization and satisfaction of the family doctor service. Chinese Journal of Health Policy, 2016(08): p. 31-36（in Chinese）.
[2]. Health and Family Planning Commission of Guangzhou Municipality. http://www.gz.gov.cn/GZ21/5/201801/4a79521adb794430bbba67a4a9e49113.shtml.. 2018.
[3]. Boerma W G W. Profiles of general practice in Europe. An international study of variation in the tasks of general practitioners［J］. The European Journal of General Practice, 2003, 9(4) : 167-168..
[4]. Health and Family Planning Commission of Guangdong Province. http://gdhealth.net.cn/ebook/2016tongjinianjian/index.html..
[5]. Wei, L., et al., The performance evaluation based on the demand side of the family doctor contract service: A focus on chronic diseases. Chinese Journal of Health Policy, 2016(08): p. 23-30（in Chinese）.
[6]. Du Z, et al., Usual source of care and the quality of primary care: a survey of patients in Guangdong province, China. Int J Equity Health, 2015. 14: p. 60.
[7]. Kuang, L., et al., Family practice and the quality of primary care: a study of Chinese patients in Guangdong Province. Fam Pract, 2015. 32(5): p. 557-63.
[8]. Rocha, K.B., et al., Assessment of primary care in health surveys: a population perspective. Eur J Public Health, 2012. 22(1): p. 14-9.
[9]. Lee, J.H., et al., Development of the Korean primary care assessment tool--measuring user

experience: tests of data quality and measurement performance. Int J Qual Health Care, 2009. 21(2): p. 103-11.
[10]. Wang, H.H., et al., Patients' experiences in different models of community health centers in southern China. Ann Fam Med, 2013. 11(6): p. 517-26.
[11]. YU M J，LI L，KUANG L. Framework of the referral system in primary care practice［J］. Chinese General Practice，2018，21（4）：375-381.（in Chinese）.
[12]. Yang, H., et al., Development of the Chinese primary care assessment tool: data quality and measurement properties. Int J Qual Health Care, 2013. 25(1): p. 92-105.

VERSION 2 – REVIEW

REVIEWER	Assistant Prof. Dr. Nithra Kitreerawutiwong Faculty of Public Health, Naresuan University Muang District Phitsanulok Province, Thailand
REVIEW RETURNED	03-May-2018

GENERAL COMMENTS	Please check the sample that the author analyzed. [p.10 line 188] - The reviewer provided a marked copy with additional comments. Please contact the publisher for full details.

REVIEWER	Lixin Jiang National Clinical Research Center of Cardiovascular Diseases, State Key Laboratory of Cardiovascular Disease, Fuwai Hospital, National Center for Cardiovascular Diseases, Chinese Academy of Medical Sciences and Peking Union Medical College, China
REVIEW RETURNED	23-Apr-2018

GENERAL COMMENTS	My comments have been addressed appropriately.

VERSION 2 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:

Reviewer: 2

Reviewer Name: Lixin Jiang

Institution and Country: National Clinical Research Center of Cardiovascular Diseases, State Key Laboratory of Cardiovascular Disease, Fuwai Hospital, National Center for Cardiovascular Diseases, Chinese Academy of Medical Sciences and Peking Union Medical College, China

Please state any competing interests or state ‘None declared’: None declared.

Please leave your comments for the authors below

My comments have been addressed appropriately.

Response:

Special thanks to you for your positive comments.

Reviewer: 1

Reviewer Name: Assistant Prof. Dr. Nithra Kitreerawutiwong

Institution and Country: Faculty of Public Health, Naresuan University, Muang District, Phitsanulok Province, Thailand

Please state any competing interests or state ‘None declared’: None

Please leave your comments for the authors below

Please check the sample that the author analyzed. [p.10 line 188]

Response:

Thanks for your comments. A total of 698 patients completed the questionnaires, with a response rate of 82%. Six patients were excluded from the analysis because of missing relevant data. 692 effective samples were ultimately included for data analysis. (P.9, line 114-116)

References:

[1]. Kuang, L., et al., Family practice and the quality of primary care: a study of Chinese patients in Guangdong Province. Fam Pract, 2015. 32(5): p. 557-63.