Author’s response to reviews

Title: Investigating the utilization of radiological services by physician patients: a population-based cohort study in Taiwan

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Author’s response to reviews:

June 22, 2013
Dr. Christopher Morrey
Executive Editor
BMC Health Services Research

Dear Dr. Morrey,

Many thanks for your kindness in considering our manuscript for possible publication in BMC Health Services Research. Our responses to the reviewers’ comments are given in a detailed point-by-point list, and all changes in our manuscript have been highlighted by using Track Changes in MS Word. We have followed your suggestion and sought the assistance of a professional editing service to have the manuscript edited for English usage.

We trust that you will perceive some merit in reconsidering this manuscript for publication in BMC Health Services Research.

Sincerely,

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Response to Reviewer 1: Dr. Evelina Pappa

Major Compulsory Comments

The resubmitted manuscript has been improved significantly, but there are still some major compulsory comments. More specifically:

1. The title needs to change again. This title limits the objective of the study to MRI utilization, whereas the objective is the utilization of radiological services. Involve all the radiological services. The authors may try something like "Investigating the utilization of radiological services by physician-patients: a cohort study........"

Answer: Thank you for this comment. We have changed the title, as suggested, to “Investigating the utilization of radiological services by physician patients: a population-based cohort study in Taiwan.”

2. Abstract
- Methods: the basic statistical analyses that were applied should be addressed
- Conclusions: the sentence describes a result rather than a conclusion. Conclusions should be written again.

Answer: In the Methods portion of the Abstract, we have added the following: “Utilization rates of each modality were compared between physicians and non-physicians, and odds ratios of the utilization of each radiology modality were measured. Multiple logistic regression analysis was used to examine the predictors of X-ray, MRI, and interventional procedures utilization during the study period” (page 3, paragraph 2, lines 5–9).

We have also revised the Abstract Conclusions: “This study revealed different utilization patterns of X-rays, MRI, and interventional procedures between physician and non-physician patients, even after controlling for such factors as socioeconomic status and major diseases” (page 4, paragraph 2, lines 1–4).

3. In Background section (page 6) put a reference at the end of the first sentence.

Answer: We have added a reference at the end of the first sentence in the Background section: “There is no mandated physician referral system or coordinated system of health care delivery in Taiwan [8]” (page 6, paragraph 1, line 1).

4. Please explain in Statistical analysis section why logistic regression analysis was used to examine the predictors for only one radiology modality, the MRI.

Answer: We agree with the Reviewer’s valuable comment. Therefore, we have added the results of logistic regression analysis examining the predictors of utilization of X-ray and interventional procedures, in which differences existed between physicians and non-physicians.

We have added a paragraph in the Results of the Abstract: “Being a physician was a significant predictor of greater usage of MRI and of less usage of X-ray
and interventional procedures” (page 4, paragraph 1, lines 5–7).

In the Statistical Analysis portion of the manuscript’s Methods section, we have added, “Multiple logistic regression analysis was used to examine the predictors of X-ray, MRI, and interventional procedures utilization during the study period” (page 9, paragraph 2, lines 8–9).

We have added two paragraphs in the Results and two new tables (Tables 6 and 7):

“Predictors of utilization of X-ray The predictors of utilization of X-ray are shown in Table 6. The occupation of physician (OR: 0.85, 95% CI: 0.72–0.99, P = 0.04) was a significant predictor of less utilization of X-ray. Other significant predictors included age (OR: 0.81, 95% CI: 0.68–0.97, P = 0.02 for age 35–44 compared to age 25–34; OR: 1.38, 95% CI: 1.09–1.75, P = 0.008 for age 45–54 compared to age 25–34; and OR: 2.03, 95% CI: 1.34–3.07, P = 0.001 for age 55–65 compared to age 25–34), coexistence of major diseases (OR: 29.21, 95% CI: 4.06–210.19, P < 0.001), and living in the central and east regions of Taiwan (OR: 1.27, 95% CI: 1.01–1.60, P = 0.04 for living in the central region compared to living in the north and OR: 1.87, 95% CI: 1.04–3.39, P = 0.04 for living in the east region compared to living in the north).”

“Predictors of utilization of interventional procedures The predictors of utilization of interventional procedures are shown in Table 7. Physicians used significantly less interventional procedures (OR: 0.67, 95% CI: 0.54–0.83, P < 0.001). Age (OR: 1.48, 95% CI: 1.11–1.97, P = 0.007 for age 45–54 compared to age 25–34 and OR: 2.46, 95% CI: 1.70–3.55, P < 0.001 for age 55–65 compared to age 25–34), male sex (OR: 1.46, 95% CI: 1.03–2.08, P = 0.04), and coexistence of major diseases (OR: 3.16, 95% CI: 2.00–4.98, P < 0.001) were significant predictors of utilization of interventional procedures” (page 11, paragraph 3 to page 12, paragraph 1) and Table 6 (page 26) and Table 7 (page 27).

5. In table 3, put an asterisk in Odds ratio and explain at the bottom of the table that it is adjusted for age, gender, ……etc

Answer: In accordance with your suggestion, we have placed an asterisk after “Odds ratio” and explained in a note at the bottom of the table that this value is adjusted for age, sex, major diseases, urbanicity, and residential regions (in Table 3, page 23).

6. It is not clear to me why in table 2 par example the utilization of MRI per 1,000 persons-year is 34 for physicians and 14 for non-physicians and in table 4 the total utilization of MRI per 1,000 persons-year, irrespective of the existence of major diseases between physician and non-physicians is 153 and 53 respectively. Why there is this difference?

Answer: Thank you for this comment. We apologize for having mistyped the utilization rate of MRI for physicians in Table 2 and have corrected it in this revision as 32 (page 22). We have also revised the relevant portion of the Results section: “The utilization rates of CT and MRI were significantly higher among physicians than among the post-matched comparison group (rate ratio [RR]: 1.24, 95% confidence interval [CI]: 1.09–1.41, P < 0.001 for CT and RR:
2.29, 95% CI: 1.84–2.87, P < 0.001 for MRI) (Table 2)” (page 10, paragraph 2, lines 3–6).

To further clarify the data, we added the exact number of physicians and non-physicians with and without major diseases in Table 4 (page 24). Since \((1,636 \# 29/1,000 \# 50 \# 124/1,000)/1,686 \# 32/1,000\), which is compatible with the utilization rate of MRI by physicians, and \((1,640 \# 14/1,000 \# 46 \# 39/1,000)/1,686 \# 14/1,000\), which is compatible with the utilization rate of MRI by non-physicians, these fit the data in Table 2. There may be some deviation in the numbers due to rounding up or down during the calculation process.

7. In Discussion section, it is mentioned that medical knowledge, familiarity with health care system and…. are the factors that may explain the higher use of MRI by physicians. In Background section, it is mentioned that every physician in charge has the right to prescribe radiological examinations. Could the self-prescription of the physicians be another reason for higher utilization of MRI by them?

Answer: Thank you for this thoughtful comment. We checked the self-prescription rate of MRI by physicians and found that it was 0.27%. We added the following sentence to the Discussion: “The self-prescription rate of MRI among the physicians was 0.27% in this study. Although physicians have the right to prescribe MRI, self-prescription among physicians was not a major reason for higher utilization of MRI” (page 13, paragraph 2, lines 11–13).

8. In Discussion section, page 13, 2nd paragraph, please remove the below sentences "Physicians’ care-seeking behavior.............among general adults [25]" because they are irrelevant.

Answer: Following your suggestion, we have removed the irrelevant sentences (page 14, paragraph 2).

9. In Discussion section, page 13, 2nd paragraph, it is mentioned that physicians treat their peers differently because the treating physician feel pressure from these informed patients. Is it only the pressure from the well informed fellow doctors or it is also a sort of showing favors to colleagues? Analyze the relationship between the treating physician and the patient-physician

Answer: We agree with the Reviewer’s comment. We have revised the sentence in question: “Previous findings have indicated that physicians may treat their peers differently than their other patients, perhaps because the treating physicians feel pressure from these informed patients, also could be a sort of showing favors to colleagues [23, 24].”(page 14, paragraph 2, lines 1–9).

Minor comments
1. In Results section, 3rd paragraph at the end, it is post-matched and not past-matched group.

Answer: Thank you for this correction. We have changed the word “past-matched” to “post-matched” (page 10, paragraph 3, line 6).
Response to Reviewer 2: Dr. Oke Gerke

Discretionary Revision:
There is one spelling error on p.12, 3rd line to last as 'past-matched' should read 'post-matched.'
Answer: Thank you for pointing this out. We have changed the word “past-matched” to “post-matched” (page 10, paragraph 3, line 6).