Author's response to reviews

Title: The impact of nurse working hours on patient safety culture: a cross-national survey including Japan, the United States and Chinese Taiwan using the Hospital Survey on Patient Safety Culture

Authors:

Yinghui Wu (wuyinghui@med.toho-u.ac.jp)
Shigeru Fujita (sfujita@med.toho-u.ac.jp)
Kanako Seto (setokana@med.toho-u.ac.jp)
Shinya Ito (s1007m09@med.toho-u.ac.jp)
Kunichika Matsumoto (rakchart@med.toho-u.ac.jp)
Chiu-Chin Huang (cchuang@must.edu.tw)
Tomonori Hasegawa (tommie@med.toho-u.ac.jp)

Version: 3 Date: 11 July 2013

Author's response to reviews:

Dear Sir,

We are grateful to reviewers for the critical comments and useful suggestions that have helped us to improve our paper. We have taken all these comments and suggestions into account in the revised version of our paper as follows.

Associate Editor's comments:

The main issues confer the lack of clarity in presenting the study rationale, a clear and focused description of the data analysis and a presentation of the results along the research questions.

#The research question of our study was clarified, and other parts were revised in accordance with the research question. The hypothesis and the purpose of our study as in the following. (Background, P6, L3-9)

“We hypothesized that long working hours would deteriorate PSC, and that the deterioration patterns would differ between countries. Moreover, the common trends observed in Japan, the US and Taiwan may be useful to improve PSC in other countries.

The purpose of this study was to clarify the impact of long working hours on PSC in countries with different cultural backgrounds using the nurse PSC databases in Japan, the US and Taiwan.”

Finally, the discussion should critically reflect the limitations of this study such as not collecting any objective data on actual workload or intensity of work (such as
patient-nurse-ratio).

“We added following sentence. (Discussion, P12, L8-13)

“This study had some limitations. It was unclear how the actual workload or work intensity affected PSC because objective indicators of ‘staffing’ such as patient–nurse ratio or patients’ severity were not collected. Because of the sampling method in each country, the target population might not be representative of the entire country. The US response rate was lower than that of Japan and Taiwan, and the characteristics of non-respondents were unknown.”

The discussion should also elaborate more on management practices and safety climate aspects impacting on those (e.g. decisions on work schedules, total working hours etc.).

“We added following sentence. (Discussion, P12, L1-3)

“Hospital managers may want to coordinate nurse working schedules to keep working hours appropriate to establish a good PSC. Such efforts might lead to a decrease in the number of adverse events due to miscommunication.”

*Copyediting:

After reading through your manuscript, we feel that the quality of written English needs to be improved before the manuscript can be considered further.

“The manuscript was proof-read by a native tongue and revised.

Reviewer: Yvonne Pfeiffer

Major compulsory revisions

1) Introduction: The basic rationale underlying the hypothesis (saying that it is interesting to investigate the relationship between patient safety culture factors and nurses’ working hours) could be elaborated more deeply. Why do the authors expect that there is a relationship? What processes do they expect to mediate this relationship?

“We added following sentence.(Background, P5, L20 – P6, L9)

“As the increase in reported events can be interpreted as deterioration in patient safety as well as an improved PSC, which enables better detection and reporting, it might be difficult to determine the impact of long working hours on patient safety using the number of reports as an indicator. An assessment of PSC might be an alternative method to evaluate the impact of long working hours on patient safety. The impact of long working hours on PSC might vary between countries because PSC cultural differences have been identified among healthcare
workers in Japan, Taiwan and the US [8]. We hypothesized that long working hours would deteriorate PSC, and that the deterioration patterns would differ between countries. Moreover, the common trends observed in Japan, the US and Taiwan may be useful to improve PSC in other countries.

The purpose of this study was to clarify the impact of long working hours on PSC in countries with different cultural backgrounds using the nurse PSC databases in Japan, the US and Taiwan.”

2) The underlying rationale for doing an international comparison of HSOPS-results is not clear to me:

Why are the three countries compared?

#In our previous study, we have already revealed that the three countries have different PSC. In this study, we would like to show the common impact of long working hours on PSC in several countries with different culture. If we could find such a common impact, it could be generalized to other countries. We added following sentence. (Background, P6, L1-9)

“The impact of long working hours on PSC might vary between countries because PSC cultural differences have been identified among healthcare workers in Japan, Taiwan and the US [8]. We hypothesized that long working hours would deteriorate PSC, and that the deterioration patterns would differ between countries. Moreover, the common trends observed in Japan, the US and Taiwan may be useful to improve PSC in other countries.

The purpose of this study was to clarify the impact of long working hours on PSC in countries with different cultural backgrounds using the nurse PSC databases in Japan, the US and Taiwan.”

How do the countries differ in their healthcare policies relating to nurses’ working hours?

#We added following sentence. (Discussion, P10, L18-20)

“In the US, more than half of nurses worked <40 h/week in contrast to Japan and Taiwan. In US hospitals, temporary nurses, who are identified as ‘agency nurses’ or ‘travel nurses’ are popular, although most hired nurses in Japan and Taiwan are permanent staff.”

Did the authors expect any country-related effects relating to the impact of nurses’ working hours on patient safety culture? Or did they expect any differences in the safety culture levels between the countries?

#Because the characteristics of PSC are different by country, the impact of long working hours on PSC might be also different by country. We added following sentence. (Background, P6, L1-6)
“The impact of long working hours on PSC might vary between countries because PSC cultural differences have been identified among healthcare workers in Japan, Taiwan and the US [8]. We hypothesized that long working hours would deteriorate PSC, and that the deterioration patterns would differ between countries. Moreover, the common trends observed in Japan, the US and Taiwan may be useful to improve PSC in other countries.”

3) The lacking development of the basic study rationale also influences the quality and discussion and conclusions sections.

A) Organizing the paper around clearly presented research questions would allow the authors commenting on them in the discussion and conclusion sections in a structured and meaningful way.

#We added following sentence. (Background, P5, L19 – P6, L9)

“These studies were based on voluntary reports of errors or near misses. As the increase in reported events can be interpreted as deterioration in patient safety as well as an improved PSC, which enables better detection and reporting, it might be difficult to determine the impact of long working hours on patient safety using the number of reports as an indicator. An assessment of PSC might be an alternative method to evaluate the impact of long working hours on patient safety. The impact of long working hours on PSC might vary between countries because PSC cultural differences have been identified among healthcare workers in Japan, Taiwan and the US [8]. We hypothesized that long working hours would deteriorate PSC, and that the deterioration patterns would differ between countries. Moreover, the common trends observed in Japan, the US and Taiwan may be useful to improve PSC in other countries.

The purpose of this study was to clarify the impact of long working hours on PSC in countries with different cultural backgrounds using the nurse PSC databases in Japan, the US and Taiwan.”

B) The statement of the last sentence in the discussion section (page 13) is not clear.

#Those sentences were changed as follows. (Discussion, P12, L4-7)

<Pre>

“Although two sub-dimensions of “Staffing” and “Teamwork within Hospital Unit” were related to working hours, as for the other 10 sub-dimensions, we could not find a relationship with working hours. Patient safety culture could have a complex structure which can be partially explained by working hours, and further investigation is needed to clarify the factors relating to patient safety culture in hospitals.”
“Although the two sub-dimensions of ‘staffing’ and ‘teamwork within units’ were related to working hours, the common deterioration patterns due to long working hours were not identified in the other 10 sub-dimensions. The difference in the deterioration pattern between countries might result from different mechanisms reflecting the cultural backgrounds.”

C) It is not clear to me whether the statement on page 13 “The increased fatigue and stress caused by long working hours would lead to…” is a conclusion of the own results or whether it relies on other previously cited studies. However, the authors bring up ideas about which processes could mediate the effects of long working hours on patient safety culture.

#The sentence was our presumption which based on our results and other previously cited studies. The expression was changed a little as follows; (Discussion, P13, L3-6)

“Thus, increased fatigue, work intensity or work stress caused by long working hours might lead to mistakes or communication and interpersonal problems resulting in less teamwork without respect, understanding, support and helping one another [11, 21-23]”

Thus, I wonder why they did not assess for example subjective stress and fatigue levels (at least for their Japanese sample, for which they gathered the data as a part of the reported study).

#Work stress of Japanese samples was also measured in this survey. We are preparing another report about the relationship between work stress and PSC.

4) There is evidence that a high number of reported events is not necessarily a sign of a bad safety culture (see for example Edmondson, 1996). It could, in contrast, be considered a sign of a vivid and positive safety culture when the employees of a hospital report a lot of incidents. (Furthermore, the number of reported incidents does not reflect their actual rate.) As the authors use this measure in their study, they should elaborate more on this and how they interpret their results in the light of this discussion.

#We added following sentence. (Discussion, P11, L4-9)

“In contrast, the increased number of reports could be considered a sign of positive PSC under which the staff easily detected errors and felt free to report. In our study, long working hours were related to poor PSC and an increase in the number of adverse events reported. An analysis adjusted for working hours or work stress might be needed to measure the relationship between a good PSC and the increase in the number of reported events.”
5) Methods: Data cleaning is mentioned multiple times, however no information is given on how this was done. The reader would like to know what criteria were used for data cleaning.

We added following sentence. (Methods, P6, L17-19)

Incomplete questionnaires, such as surveys with less than an entire section completed, those with fewer than half the total items completed, or those with identical responses to every item, were excluded from our analysis [5,6].

6) From the text, it is not entirely clear whether the development of the Japanese and especially the Taiwanese versions of the HSOPS were part of this study – as other preliminary studies are mentioned, I assume the authors relied on their work. However, the translation and adaptation processes are described in a way that makes the reader assume that this work is part of the presented study. The authors could also reference the studies which have done adaptation work and only report the important aspects of the adapted versions they use. (Additionally, I do not agree in considering a Cronbach’s alpha value of .46 as “acceptable”, see page 7, second paragraph).

Those results and explanations were deleted, and following sentence was added. (Methods, P8, L1-2)

“Internal reliability and construct validity of the questionnaire were verified in previous studies [6-8].”

7) Data Analyses: Giving the summated score as a dimension score (see page 9) makes the results harder to read (table 4). As the dimensions have different numbers of items, the “means” indicated in table 4 are not easily comparable.

The comparisons between the scores of sub-dimensions is not the purpose of this study. But Table 4 was deleted by following the instruction of another reviewer.

8) Data Analyses: The development of the different working hour groups is not clear to me.

How were the three groups defined?

We added following sentence. (Methods, P8, L20-21)

“nurses were divided into three groups by working hours per week (<40 h; 40–60 h; ≥60 h)”

What impact do their different sample sizes across the different countries have on the data and on the interpretation of the international comparisons?
According to the results of Tukey’s test in the additional file, most of the combinations only in the US data had significant difference because the sample size of US data was big enough. Therefore, Cohen’s d values were calculated to indicate the effect size of the difference.

The authors could comment/elaborate more on that, and potentially on the national backgrounds of why the working hours differ between the countries the way they do.

We added following sentence. (Discussion, P10, L18-20)

“In the US, more than half of nurses worked <40 h/week in contrast to Japan and Taiwan. In US hospitals, temporary nurses, who are identified as ‘agency nurses’ or ‘travel nurses’ are popular, although most hired nurses in Japan and Taiwan are permanent staff.”

9) In order to investigate the mediating processes between working hours and safety culture, it would have been interesting to assess some more objective measures such as there are mentioned on page 12, e.g., the nurse to patient ratio. Why did the authors not assess an indicator like that, at least in their Japanese sample?

We would like to consider it in the next time. We added following sentence. (Discussion, P12, L8-10)

“This study had some limitations. It was unclear how the actual workload or work intensity affected PSC because objective indicators of ‘staffing’ such as patient–nurse ratio or patients’ severity were not collected.”

10) Table 1: To me, it would be more interesting to see the percentages across the whole sample than reading only the percentage within a country. For example, for the bed size, I would consider it more interesting to read which percentage of the hospitals with a bed size of <300 beds is Japanese, which is Taiwanese and which is US-American compared to the whole sample. The same applies to table 2.

Because the sample size of US data was big enough, comparing between whole data and each country might not be worth.

Minor Essential Revisions

The font size seems to change within the text body.

The font size was confirmed.

Reviewer: Said Bodur
- Minor Essential Revisions

1) Table 1 and Table 4 is unnecessary, do not contribute directly to the subject. Similar data "A cross-national survey on patient safety culture: Japan, Taiwan and the U.S." is included in the article, do not need to repeat.

#Table 1 and Table 4 were deleted, and “Methods” & “Results” part were also revised to correspond with the deletion of tables.

2) In Table 2, information about "Patient Safety Grade", "Number of Events Reported" and "Years in current specialty" are not related with hypothesis in the title.

#"Patient Safety Grade" and "Number of Events Reported" are defined and used as outcome measures of patient safety culture in HSOPS. In order to estimate the effect of working hours on patient safety grade and number of events reported during the past 1 year, the odds ratio (OR) of working hours per week for patient safety grade and number of events reported were calculated using generalized linear mixed model (GLMM). Years in current specialty is also used as random effects in GLMM. Therefore, those items might be needed to show its basic status, and to understand the meaning of Table 3 (New table 2) which is the results of GLMM. For the analysis, the adjustment of years in current specialty was needed because the working hours and the workloads might be affected by years in current specialty.

3) After this correction, manuscript might be published as in the "short report" form.

#We would like to resubmit our article as a research article.

Finally, we thank the reviewers for his/her constructive comments that have helped to improve our manuscript. We look forward to hearing from you.

Yours truly,