Author’s response to reviews

Title: An Activity Analysis of Dutch Hospital-Based Physician Assistants and Nurse Practitioners

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Author’s response to reviews:

Date: 18 Jul 2019
To: Professor James Buchan

Re: "Human Resources for Health Editorial Office" shaira.gavini@springernature.com
Subject: Your submission to Human Resources for Health - HRHE-D-19-00157

Dear Professor Buchan,

We have read and appreciated the reviewer’s comments to our administrative research analysis of PAs and NPs in hospital roles. Their comments have aided us in developing a stronger paper and contributed to the readability of our manuscript.

Below we will reply in italic to the reviewers’ comments point by point and also report how we revised our manuscript accordingly.

We hope that the revised manuscript will be considered for publication.

On behalf of the co-authors,

Geert van den Brink

Reviewer #1:
As authors you have written a manuscript that reads well, is clearly written and also appears to be understandable for laymen who are not involved in this type of research. Next to that you have combined an intriguing mix of methods to collect data, making it seemingly even more robust.
Thank you, we appreciate this positive review of our manuscript.

One methodological limitation is described appropriately, i.e. data collection was confined to ‘just’ 4 hospitals, most probably distributed in 1-2 region(s) of The Netherlands

The selected hospitals are located in different regions (south, east, west and center of the country). In addition, data such as production, turnover and number of staff have been inventoried to get a good spread of the different hospitals.

The selection of the hospitals was purposeful (not random). One hospital who was selected decided not to cooperate.

We added this information to the ‘results section’.

Please have a look at exhibit 3 (some add symbols are inserted), next to that CBV is not explained elsewhere in the text. The word CBV is changed in procedure to avoid misinterpretation.

Exhibit 6 contains a 'typo': [Task substation]
The symbols and misspelling have been addressed. See also the comments by reviewer 2.

Reviewer #2:

We want to thank reviewer two for her acknowledgement of our work and relevance of this manuscript. Reviewer main concerns are related to the information provided and suggest adding more details to methods and results to improve the readability of the paper. We will reply point by point to each of the concerns.

P3 line 56: The authors stated that healthcare administrative systems are expected to objectively give insight in tasks and responsibilities of their employees. I suggest to temper this viewpoint. In general, this kind of systems are made up for a purpose other than research. Information bias can never be completely excluded.

Systems for electronic health record such as, for example, EPIC, are increasingly becoming an integral information system for hospitals where, in addition to data from the patient, data is also stored for financial registration purposes. More and more, this data is being used in research (Milinovich A, Kattan MW. Extracting and utilizing electronic health data from Epic for research. Ann Transl Med 2018;6(3):42. doi: 10.21037/atm.2018.01.13).

Nevertheless, reviewer 2 has a point regarding the reliability of this data. As in this case, we not only identified new information that was overlooked by hospital administrators, but also inefficiencies in financial accounting. We describe this aspect in the discussion and temper the statement in the background section: we changed the sentence in: ‘Healthcare administrative systems can provide an important perspective about the tasks and responsibilities of their employees, and is therefore more frequently used in health care research {Milinovich 2018}’.

P4 line 10: To improve the comparison between the numbers of physicians, PAs and NPs, please update the number of PAs and NPs (2018).
Data has been updated. ‘Since their introduction in The Netherlands the number of PAs has grown from 347 in 2012 to 1,231 in 2019 and the number of NPs increased from 1,307 to 3,672 in 2019 {Noordzij, 2016; Velde, 2016; CIBG, 2019}.’

P5 line 26-28: In my opinion, delegation of tasks may not always be of temporary nature. It always relates to supervision of the physician, regardless the timeframe.

We've reread the definition of delegation and think that with this adjustment, suggested by reviewer 2, the definition is more accurate.

We skipped the phrase: "The task is not planned routinely" because, reviewer 2 has a point that delegated tasks preformed routinely by NP's or PA's and that happens often.

However, we keep in this definition the temporary state of these tasks because the delegation is from one person to another and it isn't an official policy or law and therefore it remains temporary. When it becomes a routine and regulated by a policy or law it is a task that belongs to task-substitution. This is in line with the international literature by Record 1980 and Crandall 1984 which we included as references. It is also in line with Dutch researcher as reported in a Dutch report by Iris Wallenburg et al (I. Wallenburg, M. Janssen & A. de Bont, De rol van de Verpleegkundig Specialist en de Physician Assistant in de zorg, 2015, Instituut Beleid & Management Gezondheidszorg Erasmus Universiteit Rotterdam, url https://www.venvn.nl/Portals/1/Nieuws/2015%20documenten/20150410%20de-rol-van-de-verpleegkundig-specialist-en-de-physician-assistant-in-de-zorg.pdf). As this is only a Dutch publication we didn’t add this reference not to the list of references in this manuscript.

The new text is now:

‘Delegation is the incidental transfer of tasks. It involves entrusting certain tasks to the NP or PA. In this respect, the temporary nature as well as the direct involvement of the physician (MD) is crucial, i.e. the task is not routinely planned and there is the possibility of direct supervision and intervention by the MD. The task is performed on behalf of the MD.’

P5 line 58: The authors mention the use of questionnaires. Nowhere the content of these questionnaires is described, nor any findings.

The questionnaire consisted of open and closed questions, filled in by 75 NPs and PAs (57% of the total population NPs and PAs employed by the four hospitals at the time of the study. The questionnaire was used to list which actions were performed per NP or PA and this data was subsequently checked with the electronic system, the time schedule and the financial system. If there were inconsistencies or ambiguities, these were further discussed in the interview. The used questionnaire can be requested. The method is explained in more detail in the section ‘study design’ and ‘results’.

P6 line 2: How was the selection of hospitals carried out? Recruitment, Enrolment?

See comment reviewer 1.
P6 line 25: How did the authors determine that the included PAs and NPs were representative for the whole hospital? Based on?

The questionnaire was filled in by 75 NPs and PAs which is 57% of the total population in the hospital. Next, per department only 1 NP and 1 PA were interviewed. The interview sample consisted of 35% of the active PAs and NPs of the participating hospitals (including all specialisms and departments). The characteristics of the interviewees such as average age, experience as NP or PA and the total work experience in health care were compared with the characteristics of a national inventory among alumni (v.d. Velde; Noordzij). Because these characteristics match, we have no reason to believe that this sample is not representative. In the sections ‘Results’ we added some text to clarify this.

P6 line 52: Why was the reason for visit taken into account? This is not reflected in the results.

We used standard phraseology for why the patient was there (e.g., “reason for visit”). To avoid ambiguity or misunderstanding, we changed the sentence in ‘The collected data resulted in a list of procedures and tasks involving patients treated by the NP or PA. Next the recorded procedures, and duration of the time with the patient was used to quantify the encounter’.

P6 line 56: Retrospectively contacting the supervisor and/or financial administrator is particularly vulnerable to recall bias. How reliable are these data?

By asking questions on the basis of data that has already been collected we asked for further explanation, this is an important part of triangulation. In this process, the input afterwards is bound by rules. Precisely because of this step, the data gains reliability.

P7 line 1: In the interest of readability, it would be better if the explanation of additional tasks and other tasks would have been included in the text earlier.

In Exhibit 1 for clarity we changed ‘additional care’ in “additional tasks”.

P7 line 12: In which manner can physicians rate the overall contribution of the PA or NP (scores?)?

The managers and medical specialists were asked to rate the overall contribution of the PA or NP in terms of quality of patient care and production on a visual analog scale from 1 tot 10.

P7 line 11: How is quality of patient care defined? Quality of care is a catch-all-term. When not properly defined in domains, every physician can interpret it differently, which infringes the validity.

Physicians are traditionally viewed as the principal in charge of patient care (procedure, outcome, quality, supervision, etc.). We asked them as a critical step in administrative research of their opinion.

P7 line 16: It is not clear to me, how exactly the authors determine the supervision time of the physician. In which system is this registered? In addition, the authors "classified the degree of autonomy from the supervising medical doctor, triangulated with the patient's record". How is triangulation carried out? The authors refer to exhibit 2. But there is no mention of any involvement of MDs. Description of step 2 certainly deserves further attention.

We extract from the electronic health system (like EPIC) the production per physician and we
combined that with the production of the NP or PA inclusive the supervision of the physician. The supervision was calculated in minutes (see exhibit 3).

About step 2 in exhibit 2 we added in the sentence ‘Three researchers then independently analyzed the results by following the algorithm from exhibit 3, and reconciled any differences into one list. The triangulation process was carried out by discusses the differences in step 4.

P8 line 35: Again, how do the authors assign a degree of independent performance?

Please refer to Exhibit 3 (task analysis flowchart).

P9 exhibit 2: - What is a CVB-procedure?
- There are some strange symbols in the boxes.
- Throughout the document the authors use the abbreviation MD, here MS.

Symbols and abbreviations changed.
CBV changed in treatment procedure
MS changed to MD

We don’t see any strange symbols in our documents, maybe it is some problem with printing? Therefore, we changed Exhibit 3 so that text hopefully is better to read.

- When the MS is partly involved in the procedure, the authors defined this as delegation of tasks. Involvement of the MD is, in my opinion, too broad and too vague. MDs role is very clear in case of delegation, namely to provide supervision. MDs can also be "involved" in reallocation of tasks, for example if the PA or NP want to consult the MD, which is also often the case with peer consultation between MDs. We do not call this delegation….
- For consistency, I would like to recommend to include "other tasks" in the flowchart.

These three categories were assigned a degree of independent performance based on what the PA or NP said and corroborated by the MD. The time to perform the task was stated in minutes using the electronic system (see Exhibit 3). Bold text has been added.

Results
P9 line 28: 31 NPs and 18 PAs were included in the study; this does not match with 75 PAs and NPs mentioned on P6 line 18.

By re-reading this section we can imagine the ambiguity. We added the following sentence at the end of paragraph settings:
We used the data from 75 NP / PAs (that was 57% of the total population of PAs and NPs employed by the four hospitals at the time of the study). Of the 75 NP/PAs, we selected 32 NPs and 21 PAs for interviews, per participating department only 1 NP and 1 PA.

P9 line 32 and exhibit 4: Can the authors please include the dispersion measures?

We added the dispersion measures: The mean working hours per year for these NPs and PAs were, respectively, 1,381 (SD 238) and 1,502 hours (SD 272)

P9 line 34: 1381 and 1502 hours were assessed over 8 months. In exhibit 4, the same numbers are on an annual base?
Changes were made, it is indeed the hours for 8 months.

P10 line 6: Task transfer? Where does this term suddenly come from?

In step 2 of the data collection and analysis (pag 8) we distinguish in:
- type of task transfer
- number of tasks and activities
- duration.

We use labor substitution terms in the paper and ‘task transfer’ is one established in the literature. See the first sentence in the Conclusion paragraph where we reference the WHO document on this topic.

P10 exhibit 5: It is very risky to associate the classification of tasks to medical speciality departments, because:
- n=3 general hospitals, n=1 academic hospital, which is very low. Probably, for some departments like haematology or neurosurgery, n=1 (only in academic hospital), which is even lower. (Please include the number of departments.)
- Agreements on tasks are often made locally and are maybe even more depending on the individual MD and individual PA or NP, than the medical specialty. (This variation may become visible in the dispersion measure).

We agree very much that such tasks can vary by hospital and department, but we did not make associations, we only gave a description. These descriptions showed indeed that tasks vary. Our objective was an early foray into this new area of administrative research. We discussed this in the discussion section.

P11 Exhibit 6: How do the authors correct the hours with interviews? This crucial part is lacking. Furthermore, how reliable are these results? Earlier, the authors rightly pointed out that numbers established with interviews are particularly vulnerable for (recall) bias. See also P12 line 10.

The interviews in this administrative research strategy were more for triangulation of data and not as a primary source of data. More in detail: If the tasks related to the care of individual patients were classified as other tasks, then we discussed that in the interview when we found inconsistencies in the time schedules and the electronic system. When this could be explained by the interviewee and when indeed it concerned activities that were related to the individual patient care, a correction followed and if not then it remains in the category ‘other tasks’.

P11 Exhibit 7: Is consultation between medical specialist and PA/NP not patient-based?

This is a nuance of language, but this kind of consultation was not related to individual patient care and therefore not categorized as such. This kind of consultation was more seeking advice from someone.

P11 line 55: The presence of the physician overseeing the PA or NP was only reported a third of the time. I am just curious; can the authors associate this with years of experience of the PA or NP? Do they have figures on this?

That is indeed an interesting question, in our data we have the number of years of experience collected but it is not related by the grade of autonomy as this was not part of our research aim (unfortunately).

There are no results included, responding to the 4th aim of the study (P4): Assess the reliability of hospital administrative systems to capture the activity of PAs and NPs.
This is addressed in the Discussion section.

P12 line 33: Suddenly, in the discussion the authors described that "NPs performed 26% of all the medical tasks recorded in a systematic way. (Do the authors mean: of all tasks NPs performed, 26% was recorded in a systematic way?). Where do these figures come from?

Sentences edited to better reflect this activity; Of those procedures assessed in this eight-month time frame, NPs performed 26% of all the medical tasks recorded in a systematic way, and PAs 33% (task substitution and delegation together, see Exhibit 4).

P12 line 35: The authors mentioned the use of a validation process. How was this done? Not mentioned in the methods.

We added the explanation: The interviews and validation process (triangulation as described in step 4 of the data analysis) revealed that there was a relatively low registration or documentation of clinical tasks prior to completion of this study.

P12 line 41: Where do the figures 62% an 55% come from? Not mentioned in the results.

It’s task substitution and delegation together. We added that in the text.

P12 line 47: The PA appeared to be performing clinical tasks more independently than NPs. Where in the results can I see this myself?

It is written on page 11 line 54-60: Supervision and collaboration: The analysis of tasks also revealed that the presence of the physician overseeing the PA or NP was only reported a third of the time. For the NP it was 64% of the cases and for the PA in 68% of the cases that they executed the task or procedure autonomously (without supervision or consultation).

P14 line 25: the PA or NP were acting as contributors to a more efficient hospital service delivery. This is a very pronounced statement, not substantially justified by results.

We rewritten that sentence in: By using the results of the interviews and the data from the administrative system along with representative patient planning activities the research team was able to objectify that the PA or NP may have been acting as contributors to a more efficient hospital service delivery. This premise needs validation and more systematic observation.