

## 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

<b>TITLE (PROVISIONAL)</b>	Is there an association between nurse, clinical teacher and peer feedback for trainee doctors' medical specialty choice?: An observational study in Taiwan
<b>AUTHORS</b>	Hsu, Chih-Ming; Hsiao, Cheng-Ting; Chang, Lichun; Chang, Hung-Yu

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Julian Archer Collaboration for the Advancement of Medical Education Research & Assessment (CAMERA), Plymouth University Peninsula Schools of Medicine & Dentistry, UK
<b>REVIEW RETURNED</b>	09-Dec-2017

<b>GENERAL COMMENTS</b>	<p>Thank you for asking me to review this paper which I did with interest. The relationship between feedback and career choice is an interesting area and posing the question is important.</p> <p>However, I believe that fundamentally this paper takes a basic analysis and overstretches the findings and their significance. While the limitations section at the end of the discussion does raise this briefly - ultimately the paper is claiming a causal effect between MSF feedback and career choice. The research does not provide evidence for this - an association only at best.</p> <p>The introduction is interesting and places the research well in context. However, the research hypothesis, despite the theoretical perspective argument, is not then really addressed.</p> <p>The method is unclear as the numbers of forms handed out is not stated and therefore response rates, and overall there are very few forms (teachers only 3 in each speciality area) - this is likely to undermine the reliability of the tool. and therefore any analysis arising from the data.</p> <p>It isn't clear how the scores are dealt with and how the z scores are reached. There is no discussion about trainees who chose to go into a speciality not in the five sampled in PGY as surely this was a possibility?</p> <p>The discussion goes way beyond the brief findings. In fact with the teacher ratings being statistically significant for desired and not actual career choice makes you think that if anything any causal relationship might be the opposite to that primarily argued for. In other words that trainees try really hard to please their seniors in the</p>
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	<p>areas they think they want to build a career. The discussion about the role of nursing feedback and its importance in career choices is very over-sold.</p> <p>I think that as it stands this paper tries to say too much from too little data and not entirely the correct data. A mixed methods approach including interviews with the PGY doctors might have helped to establish any causal link.</p> <p>The paper would benefit from a detailed proof-read.</p>
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<b>REVIEWER</b>	<p>Simon Riley  Centre for Reproductive Health  Edinburgh Medical School  University of Edinburgh  Scotland, UK</p>
<b>REVIEW RETURNED</b>	09-Dec-2017

<b>GENERAL COMMENTS</b>	<p>Thank you, I enjoyed reading your study on how how trainees may form their choice of specialty during / after their first year of postgraduate study. What I think is really interesting is the methodology. However, I do have some points:</p> <ol style="list-style-type: none"> <li>1. Study aim - "Do teachers', peers', and/or nurses' assessments correlate with PGY trainees' specialty choice?" – this is only looking at a correlation – it is not designed to fully investigate the career choice thinking and influences, using a triangulation of methodologies;</li> <li>2. Theoretical perspective – extrapolating a teaching score from a 360-degree assessment to the determination of the trainees' own assessment of 'self is a very large jump in this complex decision making process, where trainees' decisions may already have been made, and 360-degree assessments are only reflecting this;</li> <li>3. How generalizable is this study. It reports on a good sized population for this type of study, but it is based solely in Taiwan which will have quite specific structural expectations including: curriculum design (amount of choice in the undergraduate curriculum; the postgraduate experience (eg number of years, options for choice prior to committing to a specialty, moving to sub-specialty training); offering 5 major initial training specialties – what about other major specialties that may then require further specialisation (eg anaesthesia, oncology, family medicine – do trainees have an opportunity to explore these?); how trainee places are allocated – on marks or on choice?; how medical care is delivered in Taiwan (public and private, primary / family medicine and hospital); there are also points surrounding your student population – your study has a 79% male student population, which is quite different from many other parts of the world.</li> <li>4. A main finding that is proposed is that nursing staff have the greatest influence on doctors choice – just because there is a correlation, it is not necessarily causal. Indeed, the correlation may be expected – the trainee is particularly interested and engaged in the specialty, and the nurse, working closely alongside can see this, and it is reflected in their reporting.</li> <li>5. It would have been appropriate to explore in a qualitative way the decision making processes of the trainees – this is essential to be able to properly draw these conclusions.</li> <li>6. The 360-degree feedback assesses the trainees' competency in that clinical environment, not their interest in that specialty as a career choice - can it be used for this purpose?;</li> </ol>
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	7. Pg6/ln46 – increasing their motives, or changing their motivation – can't this be a positive or negative event?
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<b>REVIEWER</b>	Dr Adam Moreton Greater Manchester Mental Health NHS Foundation Trust, UK
<b>REVIEW RETURNED</b>	31-Dec-2017

<b>GENERAL COMMENTS</b>	<p>Thank you for the opportunity to review this manuscript. This is an interesting topic and most of my comments relate to stylistic issues in the write-up, I've pointed out only a few here but I would recommend having this proof read by someone who has not seen this manuscript before, they will be more likely to see the grammatical errors compared to a person familiar with the text.</p> <p><b>ABSTRACT:</b></p> <ol style="list-style-type: none"> <li>1. "330 samples were collected" – it is not clear here what the 'samples' are samples of, having read the rest of the paper I would suggest changing to something such as "data from 990 assessments were included".</li> <li>2. "(desire" should probably be "(desired"</li> </ol> <p><b>PAGE 6:</b> The phrase "Post graduate year" appears here for the first time, but the acronym "PGY" is used much earlier in the manuscript.</p> <p><b>PAGE 9:</b> "the nursing staff are responsible for the PGY1's rotations" – this reads as if the nurses are allocating doctors to their jobs/ 'rotations', although I don't think this is what you actually mean.</p> <p><b>PAGE 10:</b></p> <ol style="list-style-type: none"> <li>1. Use the plural, "data were"</li> <li>2. The data processing and analysis section could be streamlined significantly, I also doubt you need to go into the finer details of entering 1s and 0s into SPSS.</li> </ol> <p><b>PAGE 12:</b> The first two paragraphs of the results section could probably be incorporated into the methods, although these paragraphs are good examples of succinct writing.</p> <p><b>TABLES:</b></p> <ol style="list-style-type: none"> <li>1. Explain the acronyms used.</li> <li>2. Make sure the headings are consistent with the text in the manuscript – i.e. in the table the heading is "Sig." but throughout the paper you refer to "p=".</li> </ol> <p><b>DISCUSSION:</b></p> <ol style="list-style-type: none"> <li>1. Use shorter sentences.</li> <li>2. "...is the first time that nurses' influence on doctors' carer choice" this sentence implies causality when you can only show association with your data.</li> <li>3. "Nurses, rather than doctors, are often considered to be the caring profession" – as currently written this is a rather bold statement to make, I imagine that there are papers out there which also show doctors to be a caring profession!</li> </ol> <p><b>PAGE 15:</b></p> <ol style="list-style-type: none"> <li>1. "from a single hospital in southern which is one of the" – it feels as if there is a word missing in this sentence.</li> </ol>
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	<p>2. I don't think that the square brackets are needed.</p> <p>3. "This might be more so for nurse assessors who have less training than the clinical educators in terms of trainee assessment" – if you are going to make this statement then I would mention that you are talking about the assessment of doctors more explicitly as I imagine nurses have plenty of training in assessing nurses. A statement such as this should also have an appropriate reference cited with it.</p> <p>4. Acronyms DOPS, OSCE, mini-CEX are not explained, perhaps just change to "workplace based assessments"?</p> <p>THROUGHOUT:</p> <p>1. Possessive apostrophes are frequently missing, i.e. for trainees', PGYs', students', etc.</p> <p>2. The text appears overwritten and frequently very long sentences could be conveyed in fewer words – this would improve the paper's overall readability.</p> <p>3. Parts of the paper come across overly conversational in tone, such as on page 7: "get hired".</p> <p>4. Different forms of past tense appear in this manuscript, it would improve readability if written in one consistently, i.e. past simple.</p> <p>5. Quite a few different ways of describing the first year of postgraduate training (PGY, PGY1, 1-year PGY training), and the doctors undertaking that year (PGY1s, PGY1 trainees, interns, trainee's, doctors) are used – it would be helpful if these could be reduced in number.</p> <p>Despite my many criticisms I do feel this is an interesting paper and once revised it would likely be suitable for publication in BMJ Open.</p> <p>Kind Regards,</p> <p>Dr Adam Moreton          MBChB (Hons), MBA (Health Exec.), MSc, MRes, MRCPsych</p>
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### VERSION 1 – AUTHOR RESPONSE

#### General comments

Please revise your title to state the research question, study design, and setting. This is the preferred format for the journal.

Reply:

This has now been done: Is there an association between nurse, clinical teacher and peer feedback for trainee doctors' medical specialty choice? An observational study in Taiwan

Along with your revised manuscript, please provide a completed copy of the STROBE checklist where the page/line numbers for the relevant information can be found (<https://strobe-statement.org>).

Reply:

This has now been done.

#### Reviewer 1

1. I believe that fundamentally this paper takes a basic analysis and overstretches the findings and their significance. While the limitations section at the end of the discussion does raise this briefly - ultimately the paper is claiming a causal effect between MSF feedback and career choice. The research does not provide evidence for this - an association only at best.

Reply:

Thank you for your comment. We agree that our analysis has examined an association relationship and not a causal one. We have therefore gone through our paper to take out any suggestions to this effect. We do, however, think that we have provided sound evidence that there is an association, something which we demonstrate has theoretical credence. We believe that we have therefore provided the foundations for future studies to build upon.

2. The introduction is interesting and places the research well in context. However, the research hypothesis, despite the theoretical perspective argument, is not then really addressed.

Reply

We agree. However, our original research hypothesis was not meant to be read as the research question we wished to answer – as we could not answer that question. Rather, it was meant as hypothesis from which we justify the rationale for our study. We therefore agree that we did not address it. We have now amended our research hypothesis to read “High feedback scores to Post Graduate Year 1 (PGY1) trainees from teachers, peers and/or nurses in a particular specialty will be associated with the PGY1’s subsequent specialty choice for their residency” – which is then reflected in our specific research question.

3. The method is unclear as the numbers of forms handed out is not stated and therefore response rates, and overall there are very few forms (teachers only 3 in each speciality area) - this is likely to undermine the reliability of the tool. and therefore any analysis arising from the data.

Reply:

The PGY training programme in Taiwan stipulates that one teacher is responsible to give an assessment to a trainee for one month. During the training period, there will be three teachers in one department giving the assessments to a trainee. This study is limited due to the regulation, which makes it difficult to infer the findings from this study to other regions.

The response rate was 100% since PGY training and 360-degree multisource feedback are compulsory under the system. Every trainee received at least one assessment feedback from their teacher, nurse, and peer. We had 330 feedback forms from teachers, 330 from nurses, and 330 from peers (N=990). In other words, we had 990 feedback in total. The samples were gathered only after the scores of the three assessments were averaged.

In addition, since PGYs are required to finish the feedback activity before the end of training as stipulated by Ministry of Health and Welfare, every evaluator will submit the scores the assessment to the Hospital so that the PGYs can obtain the certificate of training completion. All the data (i.e., PGY’s scores of the 360-degree feedback) in our study has been reviewed by IRB. Moreover, PGYs’ scores of the 360-degree feedback belongs to the Hospital.

4. It isn't clear how the scores are dealt with and how the z scores are reached. There is no discussion about trainees who chose to go into a specialty not in the five sampled in PGY as surely this was a possibility?

Reply:

We entered the scores from each group (i.e., teacher, nurse and peer) in same department into SPSS to calculate the standard score (z score). This revealed the standard deviation between the original score and the mean, which would be compared afterwards.

In terms of specialties outside the ‘main 5’, the rotation trainings in the five major departments are mandatory for PGYs in Taiwan. In order to obtain comprehensive data of the assessments, our data collection therefore focuses on these five departments. Since each department provides their training based on these five major departments, we categorised other departments under them. For example, anaesthesia department is categorised under the surgery department, and the haematological oncology department is categorised under the internal medicine department.

5. The discussion goes way beyond the brief findings. In fact with the teacher ratings being statistically significant for desired and not actual career choice makes you think that if anything any

causal relationship might be the opposite to that primarily argued for. In other words that trainees try really hard to please their seniors in the areas they think they want to build a career. The discussion about the role of nursing feedback and its importance in career choices is very over-sold.

Reply:

On reflection, we agree. We have now toned down our discussion section to fit with the data we have provided. We only discuss associations and have not only removed any suggestion of causation, but we have explicitly stated that we do not wish to infer a causative link. However, as mentioned above, we do think the data presented provides the vital first step in establishing a link.

We also agree that the causal relationship could be the opposite way around than predicted. We already highlight this in our limitations section so we retain this in our revised document.

6. I think that as it stands this paper tries to say too much from too little data and not entirely the correct data. A mixed methods approach including interviews with the PGY doctors might have helped to establish any causal link.

Reply:

We thank you for this comment. We have now clarified the situation regarding causality (as above) and further suggest that qualitative research methods should further explore the association between assessment scores and career choice to “ascertain whether PGY1s are consciously influenced by these scores and if so, in what way.”

Reviewer 2

1. Study aim - “Do teachers’, peers’, and/or nurses’ assessments correlate with PGY trainees’ specialty choice?” – this is only looking at a correlation – it is not designed to fully investigate the career choice thinking and influences, using a triangulation of methodologies;

Reply

Thank you, we believe we have addressed this issue above.

2. Theoretical perspective – extrapolating a teaching score from a 360-degree assessment to the determination of the trainees’ own assessment of ‘self’ is a very large jump in this complex decision making process, where trainees’ decisions may already have been made, and 360-degree assessments are only reflecting this;

Reply:

We agree. As we already state: “Furthermore, by the time they reach their PGY1 year, many trainees may have already made their decisions regarding specialty choice.”

We have also made it clear that there are numerous influences on career choice, both in the introduction and also in our original limitations section: “Thirdly, we have only considered the association of assessment on specialty choice. Other aspects such as lifestyle, time medical staff spend being on call and trainees’ perceptions of which specialties are ‘popular’ will also be associated with career choice.”

Once again, we highlight that, despite all of this – the association between assessment and career choice is both theoretically plausible and a first step in the further exploration of the issue. It is here that we make our unique contribution.

3. How generalizable is this study. It reports on a good sized population for this type of study, but it is based solely in Taiwan which will have quite specific structural expectations including: curriculum design (amount of choice in the undergraduate curriculum; the postgraduate experience (eg number of years, options for choice prior to committing to a specialty, moving to sub-specialty training); offering 5 major initial training specialties – what about other major specialties that may then require further specialisation (eg anaesthesia, oncology, family medicine – do trainees have an opportunity to explore these?); how trainee places are allocated – on marks or on choice?; how medical care is delivered in Taiwan (public and private, primary / family medicine and hospital)

Reply:

We agree that our study has a sizable sample, and thank you for recognising this.

The issue of generalisability is important. However, it depends what it is one wishes to generalise. If we are thinking about social influence (which we are) then we believe that this is not restricted to any specific curriculum design. Having said this, we do believe that these are worthy of examination in terms of the degrees to which each might influence career choice, but it is beyond our study (and many studies) to disentangle these issues.

In terms of our study being based solely in Taiwan, this is true. But then the vast majority of medical education research studies are also based on single-country studies: all of which have their own limitations due to their curriculum design being different, the gender ratio and so on. Therefore, we are unclear about how we are required to respond to this point beyond how we already do (in the limitations section: “Secondly, participants in our study come from a single hospital in southern Taiwan which is one of the teaching hospitals in Taiwan. As such, the extent to which our findings can be generalised to account for other trainees’ career choice motivation should take this into consideration.”) and by providing further information regarding the situation in the context of our study, which we now do: “In terms of PGYs experiences, rotation training for the PGYs in Taiwan is mandatory in five major specialties (internal medicine, surgery, obstetrics and gynaecology, paediatrics, and emergency). In order to obtain comprehensive data of the assessments, we therefore focus on these five. Furthermore, since each department provides their training based on these five major departments, we categorised other departments under them. For example, the anaesthesia department is categorised under the surgery department, and the haematological oncology department is categorised under the internal medicine department.” We hope this will be satisfactory.

4. there are also points surrounding your student population – your study has a 79% male student population, which is quite different from many other parts of the world.

Reply:

We thank the reviewer for their comment. In actual fact, the gender ratio for doctors and students differs across the world – so we could equally say that the gender ratio in the UK is also quite different from many other parts of the world:

[http://ec.europa.eu/eurostat/statistics-](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Physicians,_by_sex,_2015_(%25)_HLTH17.png)

[explained/index.php/File:Physicians,\\_by\\_sex,\\_2015\\_\(%25\)\\_HLTH17.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Physicians,_by_sex,_2015_(%25)_HLTH17.png)

<http://www.oecd.org/gender/data/women-make-up-most-of-the-health-sector-workers-but-they-are-under-represented-in-high-skilled-jobs.htm>

We are not sure what the point is here, except to add this to our list of caveats: “Furthermore, although the gender ratio of our participants reflects that of trainees in Taiwan, it should be noted that gender ratios differ dramatically across the world. As such, the extent to which our findings can be generalised to account for other trainees’ career choice motivation should take this into consideration.”

5. A main finding that is proposed is that nursing staff have the greatest influence on doctors choice – just because there is a correlation, it is not necessarily causal. Indeed, the correlation may be expected – the trainee is particularly interested and engaged in the specialty, and the nurse, working closely alongside can see this, and it is reflected in their reporting.

Reply:

We take the reviewer’s point seriously and have amended our claims accordingly (as discussed above)

6. The 360-degree feedback assesses the trainees’ competency in that clinical environment, not their interest in that specialty as a career choice - can it be used for this purpose?

Reply:

We believe that the reviewer has misunderstood our study. Our study is conceptually grounded in the area of social influence and the assessment is a manifestation of the degree to which the receiver (i.e. the PGY1 trainee) is influenced by the provider. So our argument is that the self-assessment (Who

am I? Who could I be?) is based on a person's personal contact with others and their imagination of others' judgment and assessments of them. The 360-degree feedback is one such assessment.

7. Pg6/ln46 – increasing their motives, or changing their motivation – can't this be a positive or negative event?

Reply:

Yes, we agree. We have changed this to include a potential decreasing of motive.

Reviewer 3

1. "330 samples were collected" – it is not clear here what the 'samples' are samples of, having read the rest of the paper I would suggest changing to something such as "data from 990 assessments were included".

Reply:

We have now done this (p. 2: "330 samples were collected" is revised as "Data from 990 assessments were included").

2. "(desire" should probably be "(desired"

Reply:

We have now changed this: (p. 2: "desire" is revised as "desired")

3. The phrase "Post graduate year" appears here for the first time, but the acronym "PGY" is used much earlier in the manuscript.

Reply:

We have now addressed this.

4. "the nursing staff are responsible for the PGY1's rotations" – this reads as if the nurses are allocating doctors to their jobs/ 'rotations', although I don't think this is what you actually mean

Reply:

We have now addressed this on page 9.

5. P.10 use the pleural data were

Reply:

This has been addressed.

6. The first two paragraphs of the results section could probably be incorporated into the methods, although these paragraphs are good examples of succinct writing.

Reply:

"We undertook logistic regression analyses examining each dependent variable (desired, applied and enrolled specialties) against each of the assessment scores (teachers, nurses and peers). An alpha level of  $p < .05$  was set" is shifted to p. 10.

8.

(1). Explain the acronyms used.

(2). Make sure the headings are consistent with the text in the manuscript – i.e. in the table the heading is "Sig." but throughout the paper you refer to "p=".

Reply:

(1). We now explain the acronym: Accreditation Council for Graduate Medical Education ACGME and have changed the other workplace assessment acronyms to read "workplace based assessments" as you suggest (below).

(2). We have also addressed the inconsistent heading (p. 18-20: The heading "sig." is revised as "p-value.").

9.

(1). Use shorter sentences.

(2). "...is the first time that nurses' influence on doctors' carer choice" this sentence implies causality when you can only show association with your data.

Reply:

(1). We have now gone through the manuscript and re-written to ensure sentences are shorter where necessary.

(2). We have addressed the issue of causality throughout.

10. "Nurses, rather than doctors, are often considered to be the caring profession" – as currently written this is a rather bold statement to make, I imagine that there are papers out there which also show doctors to be a caring profession!

Reply:(p. 13)

Revision –"Nurses, rather than doctors, are often considered to be the caring profession" is revised as "Compared with clinical teachers, nursing staff are often seen as the ones who are more caring to the PGY1s."

11. P.15"from a single hospital in southern which is one of the"

Reply:

Revised as "from a single teaching hospital in southern Taiwan."

12. Square brackets are not needed.

Reply:

The square brackets have been deleted from this: "As such, other aspects such as lifestyle, time medical staff spend being on call and trainees' perceptions of which specialties are 'popular' will also influence career choice."

13. This might be more so for nurse assessors who have less training than the clinical educators in terms of trainee assessment" – if you are going to make this statement then I would mention that you are talking about the assessment of doctors more explicitly as I imagine nurses have plenty of training in assessing nurses. A statement such as this should also have an appropriate reference cited with it.

Reply:

The nurses who gave the assessment to the trainees are the senior nurses and have at least over 6 years' experience of clinical practice (see clarification on Page 9). They undertake four hours of training every year and are nurse educators certified by the Joint Commission of Taiwan.

14. Acronyms DOPS, OSCE, mini-CEX are not explained, perhaps just change to "workplace based assessments"?

Reply:

These have been changed according to your suggestion.

15. Possessive apostrophes are frequently missing, i.e. for trainees', PGYs', students', etc.

Reply:

Apostrophes have been added as needed.

16. The content should be concise by using shorter sentences rather than longer ones. Simple past tense can be used for easier comprehension of the reading.

Reply:

We have done this, see above.

17. Parts of the paper come across overly conversational in tone, such as on page 7: "get hired".

Reply:

Revised as “being hired.”

18. Quite a few different ways of describing the first year of postgraduate training (PGY, PGY1, 1-year PGY training), and the doctors undertaking that year (PGY1s, PGY1 trainees, interns, trainee’s, doctors) are used – it would be helpful if these could be reduced in number.

Reply:

Most have been revised as “PGY1s”.

### VERSION 2 – REVIEW

<b>REVIEWER</b>	Simon C Riley Edinburgh Medical School University of Edinburgh Edinburgh, Scotland UK
<b>REVIEW RETURNED</b>	14-Feb-2018
<b>GENERAL COMMENTS</b>	The authors have responded to the referees’ comments and made appropriate changes to the manuscript Some minor changes Pg2 Line 22-24 Abstract - Methods / in outcome measures – remove the sentence about SPSS, this is not an outcome measure, nor is this valuable detail in an abstract – please consider focusing on key information / findings. Pg2 Line35-40 – Abstract – results - this is repeating the methods 24-33; so delete and actually comment on the results Pg13 ln37-47 – coming back to this role of nurses. They are a component of the experience and their input should be a consistent element across all rotations for every student. Do they have more time with the students – getting to know them better that may influence their reporting? Perhaps comment briefly in the discussion / limitations.

### VERSION 2 – AUTHOR RESPONSE

Reviewer: 2

General comments:

Pg2 Line 22-24 Abstract - Methods / in outcome measures – remove the sentence about SPSS, this is not an outcome measure, nor is this valuable detail in an abstract – please consider focusing on key information / findings.

Reply:

The sentence was deleted as suggested. Key information on the outcome measures are the focus of this section.

General comments:

Pg2 Line35-40 – Abstract – results - this is repeating the methods 24-33; so delete and actually comment on the results

Reply:

The sentence was deleted as suggested. All results are now summarised.

General comments:

Pg13 ln37-47 – coming back to this role of nurses. They are a component of the experience and their input should be a consistent element across all rotations for every student. Do they have more time with the students – getting to know them better that may influence their reporting? Perhaps comment briefly in the discussion / limitations.

Reply:

Description regarding the nurses having more time being with the students has been added in the Discussion as suggested.