Dear Editor,

Re: Corrections to manuscript BMC Medical Education - MEED-D-17-00243 - [EMID:4ca7aad3ec76b723]

Thank you for time taken to review the paper and the opportunity to make corrections.

We have addressed each of the comments below. We are happy to make further changes as required.

Yours faithfully,

Annette Burgess
Editor Comments:

1. Title page

Please add each authors email address

The email address for each author has been added.

2. Abbreviations

Please include abbreviations as per our submission guidelines page (details at the end of this email)

We have added the following:

LIST OF ABBREVIATIONS

MMI: Multiple Mini Interview

SJT: situational judgement tests

AGPT: The Australian General Practice and Training (AGPT)

NAC: National Assessment Centre

GP: General Practice

RTP: Regional Training Provider

SDT: self-determination theory

3. Declarations

Please ensure each declaration heading is included

Thank you, we have completed this.

Reviewer reports:

Jacqui McLaughlin (Reviewer 1):

Background:
In the theoretical framework section, please describe the process of motivation under SDT. How does competence, relatedness, and autonomy needs eventually lead to interviewers choosing to participate in MMI?

We have added the point that motivation could be explained in a number of ways. We have now extended this paragraph as follows:

Theoretical framework

Interviewers’ motivation can be viewed through the lens of self-determination theory (SDT) [11]. Although motivation can be considered in a number of ways, SDT, developed by Deci & Ryan (2000) makes intuitive sense [12]. SDT proposes that for individuals to be intrinsically motivated, three key elements are needed: 1) autonomy; 2) competence and 3) relatedness. Autonomy relates to an individual’s sense of choice in what they are doing, and their own aspirations [12]. Competence relates to an individual’s desire to attain proficiency in an area [12]. Relatedness refers to a sense of connectedness with others with similar goals and purpose [12]. We utilised SDT as a theoretical framework to explore interviewers’ motivation to take part in the MMI selection process.

Why did the authors choose SDT? They claim it "makes intuitive sense" and "the dataset appeared to resonate closely with SDT." The context of the study is an unusual application of SDT, because whether an interviewer decides to participate in a MMI is a one time decision (vs. longer term motivation in the classroom). Consider adding some discussion about the implications of this application of SDT (as a one-time event) and how it might impact the findings of the study.

We have added the following sentence to the Limitations section:

Limitations of the study

We acknowledge that interviewers who participated in this study had voluntarily chosen to do so, which may have biased our results. We also acknowledge that the opinions of the interviewers who participated in the study may not be representative of all interviewers. Although there was a balanced representation of quotes from individuals who were interviewed, we have not labelled the quotes, which would have increased the rigor of the study.

Although the use of the National Assessment Centre MMI interviews is an annual event, we consider it important to consider interviewers’ motivation to take part, as there are multiple sites that each interviewer may attend, and retention of interviewers is an important factor. Future
research might include research on training methods for interviewers and longitudinal studies that consider factors contributing to interviewer retention.

Methods:

SDT would posit that giving faculty a choice (i.e. autonomy) to participate in MMI's would increase their intrinsic motivation. However, this is not even mentioned in the method's context section.

We do mention this within the theoretical framework section as follows. Please let me know if you would like this section moved to the Methods section, which may also be an appropriate place.

Theoretical framework

Interviewers’ motivation can be viewed through the lens of self-determination theory (SDT) [11]. Although motivation can be considered in a number of ways, SDT, developed by Deci & Ryan (2000) makes intuitive sense [12]. SDT proposes that for individuals to be intrinsically motivated, three key elements are needed: 1) autonomy; 2) competence and 3) relatedness. Autonomy relates to an individual’s sense of choice in what they are doing, and their own aspirations [12]. Competence relates to an individual’s desire to attain proficiency in an area [12]. Relatedness refers to a sense of connectedness with others with similar goals and purpose [12]. We utilised SDT as a theoretical framework to explore interviewers’ motivation to take part in the MMI selection process.

Results:

Can you provide any data that describes the 40 focus group participants? Were they approximately representative of the entire sample of interviewers (e.g. 56% female, 86% English speaking background)? Or were they very different in proportions of the entire sample? If very different, this could have some implications for generalizing the findings.

Unfortunately, we do not have demographic information on those interviewed, and we will be sure to ensure that we collect this data next time. We have mentioned this now in the limitations section. Forty interviewers were interviewed (n=40; 40/308 = 13%) from five NACs, including Melbourne, Chippendale, Newcastle, Adelaide and Darwin.
SDT is the study of intrinsic motivation but the decision to participate in a MMI might also be driven by extrinsic motivation. I would like to see this discussed in the manuscript. Did the authors identify any extrinsic motivators (e.g. paid time off, helping an administrator, asked by their boss ..)? If so, the authors could consider Ryan and Deci’s Organismic Integration Theory which also includes extrinsic motivators.

We have now included the following to clarify that MMI interviewers were paid.

Interviewers

In 2015, 308 interviewers were recruited by invitation from 17 RTPs to participate in the MMI process.

Those invited included GPs with formal links to the RTPs, for example, those with responsibilities for training of GP registrars, and staff of the RTPs. The interviewers were paid a standard rate of pay for their time, as well as travel and accommodation costs. There was some professional expectation that those with formal, senior salaried roles within the RTPs, such as the Chief Executive Officer of the RTPs, and the Directors of Training, to contribute as interviewers. Interviewers either attended a two hour interview face-to-face training session, or completed an on-line training course.

It is also intriguing that "novelty" did come up as a motivating factor for interviewers since MMIs are a new. Could this be expanded upon in the context of the theoretical framework?

We do not have data on this to include, but it is certainly an element we will consider in future studies.

Why do the authors use "sense" of competence. Ryan and Deci call these "needs." Could you expand upon why the term "sense" is used or provide a reference that points the readers to more information.

The referenced used seems sufficient. Ryan and Deci refer to a “sense” of competence within this publication, for example: “for it is success at optimally challenging tasks that allows people to feel a true sense of competence”.

The authors' interpretation so "need of relatedness" seems to deviate from Ryan and Deci's framework, in which a need for relatedness or belongingness is a drive based on peoples' need to
feel like they are a part of something - like a community. Many of factors (professional obligation, held positions as trainers, sense of duty) seemed more aligned with interviewers being motivated by their internalized professional values (e.g. duty). The factor "enjoyed the opportunity to meet with their colleagues" seemed more appropriate for relatedness. Could the authors make more explicit connections between the relatedness factors and Ryan and Deci's framework to help the reader better understand the motivational aspects of this theme?

Thank you. We have corrected as follows:

**Relatedness**

When individuals have similar goals and a similar sense of purpose, a sense of connectedness may be fostered [12,15, 21]. Although interviewers felt a sense of duty to their profession to participate, they also valued the opportunity to network with their peers. Connectedness is fostered within groups with the same ideals and goals [12,15, 21]. The interviewers appreciated and enjoyed being part of a like-minded professional community, interested in improving the selection process through their expertise. The learning context of the MMIs, with breaks to meet and discuss applicants’ performance involves a process of socialisation, and the social context of these meetings promoted communal engagement from experienced and less experienced interviewers. Interviewers also found the MMIs to be an opportunity to connect with the junior doctors, many of whom will be part of the next generation of general practitioners, and learn about their current challenges.

The factors (timetables, briefings) inhibiting motivation were very detail-oriented. Was there an overall theme of what inhibited motivation? Also, these factors seemed to be offered in a different vantage point of the interviewer. For example, how does poor implementation of the MMI impact interviewers’ motivation? From this small slice of data, it seems some of the themes from an interviewer-perspective might be 1) interviewers expectations (e.g. expectation of organization) and 2) too much challenge (people are motivated by optimal challenges).

Thank you for these useful suggestions. We have changed the following paragraph.

**Factors hindering motivation**

Our results indicated signs of organisational overload in delivering the complex logistics within available resources. Factors hindering interviewer motivation were largely related to the need for careful attention to administrative details at some sites. Some interviewers had particular expectations regarding the organisation and implementation of the MMIs, and these expectations
were not always met. It was considered that improvements were needed in terms of the number of candidates interviews each day; the provision of timetables; and clear briefing procedures. Previous research has demonstrated that support for the needs of staff increase work satisfaction [22]. Lack of support, and lack of consideration for the needs of staff hinder motivation.

Could you provide clarity about who is getting the training for the "on the job training" and "discussions with experienced interviewers" themes? Are you talking about the applicants or the interviewers? Because this would make a difference as to whether the data fits in this section.

Thank you, we have corrected this wording as follows:

Learning through practice was considered by interviewers to be an integral part of their learning experience:

“actually doing it in practice, I think you can only really understand that by actually doing it on the day, because, you know, even, sort of – I think we went through, maybe, three or four, sort of, hypotheticals, um, but again, you don’t, sort of, really appreciate the diversity and how it all unfolds until the actual day...because, there’s so much variability in, the responses from the registrars, I – I don’t think any training will actually fully equip you for that”.

Additionally, interviewers perceived that not only interviewing, but also discussions with experienced interviewers at the briefing sessions or breaks, and reflection on their own reasoning provided a form of training:

“Doctor A, as an interviewer says, “Well, this is the candidate, and they use different language and ideas,” and the next doctor doesn’t. And after a while you - you get - the language, the idea; you’re learning and reflecting on what you’re doing. I think that’s our best training”.

Discussion:

In general, I would've expected more discussion concerning other research on MMI interviewers. A number of studies have been published about MMIs and interviewer experiences and some discussion of that literature would be helpful for understanding how this study extends what's already been done. In other words, what gap does this work fill in the larger body of research literature? (eg Humphrey, Sarah, et al. "Multiple mini-interviews: opinions of candidates and interviewers." Medical education 42.2 (2008): 207-213.
Multiple Mini Interviews (MMIs) are being used by a growing number of postgraduate training programs and medical schools as their interview process to select entry into their training programs. Canada, Australia and the United Kingdom have used MMI to assess non-cognitive characteristics of postgraduate medical trainees, with early findings suggesting that the MMI offers a useful format to select junior doctors for specialty training [5,6,7,8,9]. The expectation is that this method will assist in the selection of candidates who are team players, with communication skills that allow them to connect with both patients and other healthcare professionals. The MMI is different from the typical interview process in a number of ways. Applicants spend a brief period of time with one interviewer and then move to the next interview room. The MMI format is based on the Objective Structured Clinical Examination (OSCE) format [5,8]. The MMI format shows greater reliability and content validity than the traditional interviews ([5] and is more cost-effective [10].

Setting up the MMI is a resource intensive process, and implementation of the MMI requires a large number of interviewers, with a number of candidates being interviewed simultaneously. Interviewers are normally medical practitioners, and this requires them to be taken away from patient care in order to participate in the MMI. Given the extensive resource requirements and recruitment requirements of MMIs, it is practical to investigate interviewers’ motivation for participating in MMIs. Although motivation is a complex issue that can be theorised in a number of ways, developing an understanding of the interviewers’ motivation to take part in the MMI selection process is important to future recruitment and retention of interviewers. Although several studies have considered candidates’ and interviewers’ perceptions of fairness [9,11], little has been published regarding interviewers’ motivation to participate in the process. The purpose of our study was to investigate interviewers’ motivation to participate in MMIs at the 2015 National Assessment Centre (NAC) for entry into Australian General Practice training. Our research question was “What motivates individuals associated with Regional Training Providers (RTPs) to participate as interviewers in a national assessment selection process?”
It would also be helpful in the discussion section to have a paragraph concerning other basic motivation theories and what SDT contributes that others don't (e.g. Expectancy Theory).

There is very limited discussion about factors hindering motivation. Can you link this finding to any literature and discuss the implications of this? Is it similar to what others have found? Or is it different? Can you discuss this finding more in the context of motivation theory? What are the implications of this finding for AGPT and others using the MMI for interviews?

Thank you for pointing this out. We have included the following

Factors hindering motivation

Our results indicated signs of organisational overload in delivering the complex logistics within available resources. Factors hindering interviewer motivation were largely related to the need for careful attention to administrative details at some sites. Some interviewers had particular expectations regarding the organisation and implementation of the MMIs, and these expectations were not always met. It was considered that improvements were needed in terms of the number of candidates interviews each day; the provision of timetables; and clear briefing procedures. Previous research has demonstrated that support for the needs of staff increase work satisfaction [22]. Lack of support, and lack of consideration for the needs of staff hinder motivation.

Are there next steps for this research? What additional research questions need to be answered to advance this work and improve our practice with MMIs? What opportunities do we have moving forward based on this study?

We have added the following:

Limitations of the study

We acknowledge that interviewers who participated in this study had voluntarily chosen to do so, which may have biased our results. We also acknowledge that the opinions of the interviewers who participated in the study may not be representative of all interviewers. Although there was a balanced representation of quotes from individuals who were interviewed, we have not labelled the quotes, which would have increased the rigor of the study.

Although the use of the National Assessment Centre MMI interviews is an annual event, we consider it important to consider interviewers’ motivation to take part, as there are multiple sites
that each interviewer may attend, and retention of interviewers is an important factor. Future research might include research on training methods for interviewers and longitudinal studies that consider factors contributing to interviewer retention.

References:

For references 10 and 14, consider replacing them or adding additional references based on the primary research literature. The references provided seem to be popular press books written for the general public.

Thank you. We have deleted Pink (10), and added an additional eight references.

Martina Kelly (Reviewer 2): In this study researchers sought to understand interviewee motivation to partake in MMI selection for postgraduate family physician training. They interviewed 40 participants (using focus group?) and used framework analysis, informed by self-determination theory to examine the data. They conclude that interviewees are motivated by a sense of duty, of giving back to the profession.

My review is informed by my position as a family physician, working in an academic environment, involved with postgraduate training.

The research question is relevant, given the importance of 'candidate fit' with career selection, success within postgraduate training and the need to graduate family physicians that will contribute patients healthcare needs in the community.

However, in order to better appraise the findings, I'd suggest that the methods section needs more detail. I've outlined some suggestions below - which I hope are helpful.

1. I appreciated that the authors provided detail on the Australian context (and interested to read about this) but wondered about the practicalities of how interviewers for the MMI are recruited.

Some questions I had - are interviewers remunerated (to cover locum costs; accommodation; travel) -is it an expectation/requirement of working or within a RTP (e.g. I could imagine that it might be expected of a program lead to contribute - part of the job).

- are all family physician invited to partake in the MMI process or only those involved in postgraduate training? I wondered how these factors might play into motivation or was this addressed in the interviews? I also wondered about the MMI training provided (as this seemed to link to the finding of learning more about the process)
We have now added a Research Context section to included the following:

MMI Interviewers

In 2015, 308 interviewers were recruited by invitation from 17 RTPs to participate in the MMI process.

Those invited included GPs with formal links to the RTPs, for example, those with responsibilities for training of GP registrars, and staff of the RTPs. The interviewers were paid a standard rate of pay for their time, as well as travel and accommodation costs. There was some professional expectation that those with formal, senior salaried roles within the RTPs, such as the Chief Executive Officer of the RTPs, and the Directors of Training, to contribute as interviewers. Interviewers either attended a two hour interview face-to-face training session, or completed an on-line training course.

We have also added the following to the Methods section

Interviews

A convenience sample of NAC sites was used. In total, 40 interviewers were interviewed (n=40; 40/308 = 13%) from five NACs, including Melbourne, Chippendale, Newcastle, Adelaide and Darwin. All interviewers who were interviewed were general practitioners, and were interviewed on a day that they participated as interviewers. They invited to voluntarily take part in the study by external researchers who were not employed by the RTPs, and were interviewed by these researchers (authors AB, CR, PS or KR).

The interview questions were structured and designed to gain a deep understanding of the interviewers’ motivation to participate in the interviews in addition to their usual work. For example “What factors motivated you to take part as an interviewer today?”, “Are there any elements need improving to make it more likely you would return to interview next year?”.

2. Could the authors provide more detail on how interviewees for this study were recruited? How was it presented to potential participants and was this a convenience sample or more purposive (for example to look for differences in motivation in relation to experience training, urban or rural physicians). Some descriptive data of the sample interviewed would be helpful - were they all physicians or were different professions involved? (and if so, how examined in the analysis) When were interviews conducted e.g. on the day of the MMI or spread out over time? By whom - for example if being interviewed by someone working for the organizers of the MMI - might that impact on data collection?
The following sentences were added to the Data Collection section.

Interviews

A convenience sample of NAC sites was used. In total, 40 MMI interviewers were interviewed (n=40; 40/308 = 13%) from five NACs, including Melbourne, Chippendale, Newcastle, Adelaide and Darwin. All MMI interviewers who were interviewed were general practitioners, and were interviewed on a day that they participated as interviewers. They invited to voluntarily take part in the study by external researchers who were not employed by the RTPs, and were interviewed by these researchers (authors AB, CR, PS or KR).

The interview questions were structured and designed to gain a deep understanding of the interviewers’ motivation to participate in the MMI interviews in addition to their usual work. For example “What factors motivated you to take part as an interviewer today?”, “Are there any elements need improving to make it more likely you would return to interview next year?”.

I think it was only on second read that I realized that the study was focus group - not one-to-one interviews? How many focus groups were conducted? Might this impact on the data collected e.g. group norming? 

I apologies, this title (‘focus groups’) under Data Collection was misleading. it was one on one interviews, and this has now been corrected as follows under data collection.

3. I would like to know a little bit more about the questions asked.

We have added this in the data collection section:

The interview questions were structured and designed to gain a deep understanding of the interviewers’ motivation to participate in the interviews in addition to their usual work. For example “What factors motivated you to take part as an interviewer today?”, “Are there any elements need improving to make it more likely you would return to interview next year?”.

4. I don't know very much about framework analysis and would be grateful for a few more sentences on why this was chosen and how it differs from say, thematic analysis - what did it add?

We have restructured the paragraph below:
Data analysis

Interview data were transcribed verbatim. Framework analysis was used to code and categorise data into themes [13,14]. Framework analysis provides a method to structure data to assist in answering research questions. Emergent themes in the dataset appeared to resonate closely with key constructs of SDT [12]. Thereafter, SDT was used as a conceptual framework to identify recurrent themes. A coding framework was developed to code the entire dataset through the theoretical lens of SDT.

5. How did the study team account for their own reflexivity within the analysis - I was unclear if this was an independent study or conducted by people involved in the set up of the MMI, family physicians or GP trainers? Without these details I found it hard to trust the findings. While as a family doctor the findings resonated, I also found them somewhat wholesome. Just drawing on my own experience I could imagine that some GP trainers might volunteer because of a negative experience with a trainee. This was hinted at within some of the quotes; so a possible interpretation might not be 'out of a sense of duty' but rather to prevent having to work with potentially challenging trainees?? In other words - would some interviewers have a vested interest? I wondered if the focus groups revealed any contesting motivations - it reads like all interviewees had similar motivations -but was there the possibility that within the focus group differences between different physician groups might not appear? Perhaps, if that's a possibility it could be addressed in the limitations.

We have highlighted the fact that the researchers were external to the organisation.

All MMI interviewers who were interviewed were general practitioners, and were interviewed on a day that they participated as interviewers. They invited to voluntarily take part in the study by external researchers who were not employed by the RTPs, and were interviewed by these researchers (authors AB, CR, PS or KR).

Quotes would benefit from being labelled - how do we know not all from a single focus group / participant? Hopefully these details are relatively easy to provide. This might help the authors reflect on some additional study limitations and help with issues of rigor (some sentences would be helpful in this regard)/ credibility of findings.

The quotes were from individual interviews. We agree that we should have labelled the quotes I the paper, but failed to do this. Although the quotes were balanced from different individuals, unfortunately we are not able to label the quotes. We have addressed this in the limitations section.

Although there was a balanced representation of quotes from individuals who were interviewed, we have not labelled the quotes, which would have increased the rigor of the study.
6. I was unclear how the survey data related to the research question and was unable to relate the demographic data reported to the interview data - was it to suggest that the participants who partook in the focus groups were representative of the entire sample?

The survey data provides demographic on all interviewers (n=308). Unfortunately we do not have demographic data on those who took part in the study (n=40, 13%). We have acknowledged in the limitations section that the opinions of those interviewed may not be representative of all interviewers.

We also acknowledge that the opinions of the interviewers who participated in the study may not be representative of all interviewers.

Overall the paper is easy to follow, there are a few places where the text could be tighter and a few minor typos. Kind regards

Laura Hopson (Reviewer 3): This paper through a mixed methods model (although this is primarily a qualitative study) attempts to define the motivations for interviewers to participate in the Australian MMI program to select post graduate trainees. While not explicitly stated, the authors imply that recruitment of interviewers is posing challenges. I would appreciate a clearer statement of whether this is truly the issue that they are trying to address. Explicitly addressing this might also broaden the applicability of this study to other domains and similarly resource intensive programs such as oral board examinations for some American specialties and medical school OSCEs. One significant limitation about the paper as presented is that it feels very limited in scope and evokes a bit of "so what" as it is currently framed. This could be addressed by reframing of the paper to include an explicit statement of why this matters as well as how these results could be applied to address some of the implied challenges of recruitment for the MMI and other similar types of examinations.

We have now included the following in the Background:

Multiple Mini Interviews (MMIs) are being used by a growing number of postgraduate training programs and medical schools as their interview process to select entry into their training programs. Canada, Australia and the United Kingdom have used MMI to assess non-cognitive characteristics of postgraduate medical trainees, with early findings suggesting that the MMI offers a useful format to select junior doctors for specialty training [5,6,7,8,9]. The expectation is that this method will assist in the selection of candidates who are team players, with communication skills that allow them to connect with both patients and other healthcare professionals. The MMI is different from the typical interview process in a number of ways.
Applicants spend a brief period of time with one interviewer and then move to the next interview room. The MMI format is based on the Objective Structured Clinical Examination (OSCE) format [5,8]. The MMI format shows greater reliability and content validity than the traditional interviews ([5] and is more cost-effective [10].

Setting up the MMI is a resource intensive process, and implementation of the MMI requires a large number of interviewers, with a number of candidates being interviewed simultaneously. Interviewers are normally medical practitioners, and this requires them to be taken away from patient care in order to participate in the MMI. Given the extensive resource requirements and recruitment requirements of MMIs, it is practical to investigate interviewers’ motivation for participating in MMIs. Although motivation is a complex issue that can be theorised in a number of ways, developing an understanding of the interviewers’ motivation to take part in the MMI selection process is important to future recruitment and retention of interviewers. Although several studies have considered candidates’ and interviewers’ perceptions of fairness [9,11], little has been published regarding interviewers’ motivation to participate in the process. The purpose of our study was to investigate interviewers’ motivation to participate in MMIs at the 2015 National Assessment Centre (NAC) for entry into Australian General Practice training. Our research question was “What motivates individuals associated with Regional Training Providers (RTPs) to participate as interviewers in a national assessment selection process?”

The qualitative portion of the study utilizing Framework analysis appears to be well done from the data analysis perspective and use an appropriate methodology. However, I will acknowledge that I am not an expert in the subtleties of qualitative analysis methods and will defer to someone with more expertise on the finer points. I would also like the authors to briefly elaborate on how their interview/qualitative data was obtained and the interview process. How were the interviewees selected? Was a structured interview performed? If so, how was it developed? (page 5 methods)

We have made the following changes to the Data collection section:

Interviews

A convenience sample of NAC sites was used. In total, 40 MMI interviewers were interviewed (n=40; 40/308 = 13%) from five NACs, including Melbourne, Chippendale, Newcastle, Adelaide and Darwin. All MMI interviewers who were interviewed were general practitioners, and were interviewed on a day that they participated as interviewers. They invited to voluntarily take part
in the study by external researchers who were not employed by the RTPs, and were interviewed by these researchers (authors AB, CR, PS or KR).

The interview questions were structured and designed to gain a deep understanding of the interviewers’ motivation to participate in the MMI interviews in addition to their usual work. For example “What factors motivated you to take part as an interviewer today?”, “Are there any elements need improving to make it more likely you would return to interview next year?”.

The rationale for the inclusion of the quantitative survey which appears to contain primarily demographic information was not clear. Questions such as how these large group demographics relate to the subgroup of 40 which completed the interview were also not clear. Did the interview subgroup reflect the demographics of the group as a whole?

We agree, and have now addressed this in the Limitations section:

Limitations of the study

We acknowledge that interviewers who participated in this study had voluntarily chosen to do so, which may have biased our results. We also acknowledge that the opinions of the interviewers who participated in the study may not be representative of all interviewers. Although there was a balanced representation of quotes from individuals who were interviewed, we have not labelled the quotes, which would have increased the rigor of the study.

Although the use of the National Assessment Centre MMI interviews is an annual event, we consider it important to consider interviewers’ motivation to take part, as there are multiple sites that each interviewer may attend, and retention of interviewers is an important factor. Future research might include research on training methods for interviewers and longitudinal studies that consider factors contributing to interviewer retention.

Minor edits

Page 2 Abstract background - include a statement of why this matters Page 2 abstract conclusion - how is this knowledge to be used?

The following has been added:
ABSTRACT

Background

Multiple Mini Interviews (MMIs) are being used by a growing number of postgraduate training programs and medical schools as their interview process to select entry into their training programs.

The Australian General Practice and Training (AGPT) uses a National Assessment Centre (NAC) approach to selection into General Practice (GP) Training, which include MMIs. Setting up the MMI is a resource intensive process, and implementation of the MMI requires a large number of interviewers, with a number of candidates being interviewed simultaneously. In 2015, 308 interviewers participated in the MMI process – a decrease from 340 interviewers in 2014, and 310 in 2013. At the same time, the number of applicants has steadily increased, with 1,930 applications received in 2013, 2,254 in 2014, and 2,360 received in 2015. This has raised concerns regarding the increasing recruitment needs, and the need to retain interviewers for subsequent years of MMIs. Given the extensive resource and recruitment requirements of MMIs, it is practical to investigate interviewers’ motivation for participating in MMIs. In this study, we utilised self-determination theory (SDT) to consider interviewers’ motivation to take part in MMIs at national selection centres.

Conclusion

Interviewers’ motivation for contributing to the MMIs were largely related to their desire to contribute to their profession, and ultimately improve future patient care. Interviewers recognised the importance of interviewing, and felt their individual roles made a crucial contribution to the profession of general practice. Good administration and leadership at each NAC is needed. By gaining an understanding of interviewers’ motivation, and enhancing this, engagement and retention of interviewers may be increased.

Page 3 Line 27 Need a citation for the sentence ending with "...MMI offers a useful format to select junior doctors for specialty training."

We have added the following citations:

Canada, Australia and the United Kingdom have used MMI to assess non-cognitive characteristics of postgraduate medical trainees, with early findings suggesting that the MMI offers a useful format to select junior doctors for specialty training [5,6,7,8,9].
It sounds as though this MMI is set up as multiple short unstructured interviews but I was not entirely clear. One of the aspects of the MMI as originally described was to structure these interactions to avoid only have "first impressions" and have interviewees assessed on task performance as well as responses to structured questions. Would suggest clarifying the phrasing in this section as to how the Australian MMI is structured.

Thank you for pointing this out. We have rephrased and added to the paragraph:

Multiple Mini Interviews (MMIs) are being used by a growing number of postgraduate training programs and medical schools as their interview process to select entry into their training programs. Canada, Australia and the United Kingdom have used MMI to assess non-cognitive characteristics of postgraduate medical trainees, with early findings suggesting that the MMI offers a useful format to select junior doctors for specialty training [5,6,7,8,9]. The expectation is that this method will assist in the selection of candidates who are team players, with communication skills that allow them to connect with both patients and other healthcare professionals. The MMI is different from the typical interview process in a number of ways. Applicants spend a brief period of time with one interviewer and then move to the next interview room. The MMI format is based on the Objective Structured Clinical Examination (OSCE) format [5,8]. The MMI format shows greater reliability and content validity than the traditional interviews ([5] and is more cost-effective [10].

Add in a sentence as to why we need to understand motivations as on the next page it is implied but not explicitly stated that there is a shortage.

Can you place these numbers in context? Are centers reporting difficulty recruiting or staffing the MMI?

Thank you for these comments. We have addressed them as follows:

Although several studies have considered candidates’ and interviewers’ perceptions of fairness [9,11], little has been published regarding interviewers’ motivation to participate in the process. The purpose of our study was to investigate interviewers’ motivation to participate in MMIs at the 2015 National Assessment Centre (NAC) for entry into Australian General Practice training. Our research question was “What motivates individuals associated with Regional Training Providers (RTPs) to participate as interviewers in a national assessment selection process?”
Theoretical framework

Interviewers’ motivation can be viewed through the lens of self-determination theory (SDT) [11]. Although motivation can be considered in a number of ways, SDT, developed by Deci & Ryan (2000) makes intuitive sense [12]. SDT proposes that for individuals to be intrinsically motivated, three key elements are needed: 1) autonomy; 2) competence and 3) relatedness. Autonomy relates to an individual’s sense of choice in what they are doing, and their own aspirations [12]. Competence relates to an individual’s desire to attain proficiency in an area [12]. Relatedness refers to a sense of connectedness with others with similar goals and purpose [12]. We utilised SDT as a theoretical framework to explore interviewers’ motivation to take part in the MMI selection process.

RESEARCH CONTEXT

The context for our research was the 2015 NAC MMI process. A total of 2,197 applicants were assessed in the NAC process and 2,154 applicants completed the MMI.

Interviewers

In 2015, 308 interviewers were recruited by invitation from 17 RTPs to participate in the MMI process.

Those invited included GPs with formal links to the RTPs, for example, those with responsibilities for training of GP registrars, and staff of the RTPs. The interviewers were paid a standard rate of pay for their time, as well as travel and accommodation costs. There was some professional expectation that those with formal, senior salaried roles within the RTPs, such as the Chief Executive Officer of the RTPs, and the Directors of Training, to contribute as interviewers. Interviewers either attended a two hour interview face-to-face training session, or completed an on-line training course.

MMI stations

The MMI consisted of six stations. The questions for each station were blueprinted against the six expected competency domains of entry-level registrars provided by The Royal Australian College of General Practice and the Australian College of Rural and Remote Medicine. These include communication and interpersonal skills; clinical reasoning and analytical/problem solving skills; organisational management skills; sense of vocation; personal attributes (such as the capacity for self reflection and awareness of the impact of cultural issues on delivery of primary healthcare); and ethical attributes. The MMI took place in interview format. It utilised
many short independent assessments, each assessed by one trained interviewer, and each taking six minutes to complete.

Page 5 Line 55 "…with most interviewers rotating between one or more MMI stations" Awkward phrasing to describe interviewer experience. This statement seems to just say that the interviewers actually participated. Suggest either refining to indicate their experience with different stations or eliminating.

We have deleted these sentences

Page 6 Lines 9-11 It would be useful to clarify whether the "senior admin" and "supervisor" designations are medical personnel Page 7 Line 19 Recommend minor rephrasing for clarity perhaps "Forty [MMI] interviewers were interviewed [by the study team] from the five NACs….

Thank you, we have made the following changes:

The medical educators and supervisors were also qualified general practitioners.

Interview results

Forty MMI interviewers were interviewed (n=40; 40/308 = 13%) from five NACs, including Melbourne, Chippendale, Newcastle, Adelaide and Darwin.

Quotes in the results sections appear to effectively illustrate concepts.

Page 13 Line 17-19 Limitations can be fleshed out with 1-2 additional phrases. Not only were interviewees volunteers but did they reflect the population doing the interviews.

We have now expanded the limitations section:

Limitations of the study

We acknowledge that interviewers who participated in this study had voluntarily chosen to do so, which may have biased our results. We also acknowledge that the opinions of the interviewers who participated in the study may not be representative of all interviewers. Although there was a
balanced representation of quotes from individuals who were interviewed, we have not labelled the quotes, which would have increased the rigor of the study.

Although the use of the National Assessment Centre MMI interviews is an annual event, we consider it important to consider interviewers’ motivation to take part, as there are multiple sites that each interviewer may attend, and retention of interviewers is an important factor. Future research might include research on training methods for interviewers and longitudinal studies that consider factors contributing to interviewer retention.

Conclusion - see comments above to provide some real world implications of the findings.

We have added the following sentence to the conclusion:

CONCLUSION

Recruiting the best candidates to postgraduate medical training programs is central to the success and quality of the medical workforce. The interviewers’ motivation for contributing to the MMIs were largely related to their desire to contribute to their profession, and ultimately improve future patient care. Interviewers recognised the importance of interviewing, and felt their individual roles made a crucial contribution to the profession of general practice. Interviewers conveyed a sense of duty to their profession; a desire to contribute their own expertise, and improve their own interview skills. This study also identified key elements to maintaining the interest of interviewers and recruiting further interviewers: attention to detail in administration, with shorter days, longer breaks, and adherence to briefing procedures. By gaining an understanding of interviewers’ motivation, and implementing methods to enhance this, engagement and retention of interviewers may be increased.

Annette Mercer, PhD (Reviewer 4): This is an interesting and worthwhile piece of work. Volunteers to the interview process are important and should be valued. One way of doing this is to gain feedback from them and use it to improve future interviewing events. I like the framework that was used.

Before publication I believe that this article needs considerable editing and re-structuring. There is a great deal of repetition and in some cases, what is being repeated is not the same as previously, for example the list of reasons why people interview changes slightly each time it is documented.
The Background section is good and does not need much change. The Research Context is useful but some of the aspects given in the Methods should be in this section, for example the section headed 'MMI stations' is part of the context, it is not part of the research project. Similarly the first paragraph of the RESULTS. It is important to separate the conduct of the MMIs from the investigation of the interviewers' motivation, which is the objective of the research.

We have changed and moved this section out of Methods.

RESEARCH CONTEXT

The context for our research was the 2015 NAC MMI process. A total of 2,197 applicants were assessed in the NAC process and 2,154 applicants completed the MMI.

Interviewers

In 2015, 308 interviewers were recruited by invitation from 17 RTPs to participate in the MMI process.

Those invited included GPs with formal links to the RTPs, for example, those with responsibilities for training of GP registrars, and staff of the RTPs. The interviewers were paid a standard rate of pay for their time, as well as travel and accommodation costs. There was some professional expectation that those with formal, senior salaried roles within the RTPs, such as the Chief Executive Officer of the RTPs, and the Directors of Training, to contribute as interviewers. Interviewers either attended a two hour interview face-to-face training session, or completed an on-line training course.

MMI stations

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It is not clear what purpose is served by the reporting of the interviewer demographics. It would have been useful to know the demographics of the 40 people participating in the research project and how representative this group is of the wider group. I think demographics are often best shown in a table, so that it's all very clear, with all categories represented. It was designated as a convenience sample and that is fine, but a description of the sample would be helpful. Abbreviations such as 'admin' should be written in full.

Thank you, we have addressed these comments in the paper, and also in the limitations section.

More information is needed on the interviews conducted with the interviewers. In one section they are reported as 'Focus group results'. Were they individual interviews or focus groups? Whatever the format of the interviews they need to be explained in detail - this is the essence of the research. How long? who conducted the interviews/focus groups? structured? were they the same across sites?

Thank you, we have now provided clarification as follows:

Interviews

A convenience sample of NAC sites was used. In total, 40 interviewers were interviewed (n=40; 40/308 = 13%) from five NACs, including Melbourne, Chippendale, Newcastle, Adelaide and Darwin. All interviewers who were interviewed were general practitioners, and were interviewed on a day that they participated as interviewers. They invited to voluntarily take part in the study by external researchers who were not employed by the RTPs, and were interviewed by these researchers (authors AB, CR, PS or KR).

The interview questions were structured and designed to gain a deep understanding of the interviewers’ motivation to participate in the interviews in addition to their usual work. For example “What factors motivated you to take part as an interviewer today?”, “Are there any elements need improving to make it more likely you would return to interview next year?”.

I understand the value of verbatim quotations in qualitative research. However some of these are too long and should not include the 'ums' and 'ahs. As they stand these quotations are difficult to read and comprehend. Make sure the essence is there but not all the 'wordy bits', which just confuse.

Thank you, we have now cleaned this up further in the results section.
The issue of written feedback suddenly appears in the Results. This sounds quite important in this context, so it should be in the Research Context section so we know that it exists.

I believe that clarity has now been provided by changing the following sentence.

For example, providing succinct written comments when marking candidates on their performance in the MMI interviews was recognised as a learnt skill.

Walter Tavares (Reviewer 5): This study explores the role of MMI interviewer motivation using SDT as a theoretical lens. To understand this construct the authors surveyed and interviewed a number of MMI interviewers who had just participated in an MMI process. They find a number of interesting and potentially relevant findings, particularly toward supporting recruitment and retention of interviewers (both for an against) in the future (one of the rationales provided for conducting this study). I'm less clear on what this study contributes to our understanding beyond that purpose. Also, there are some details missing in the reporting and analysis of this study that would need to be addressed before recommending it for publication.

* The authors aim to study interviewer's motivations but it's not clear why. Rationales given include: it takes times away from clinical work, is resource intensive and might affect future recruitment and interviews. While all true, what does the literature say about motivation specifically in these or other areas and what is unique about the MMI context that suggests new or additional research is needed? This is oddly missing. While the authors are thorough in their review of the MMI, this section on motivation needs to be expanded IF it is the crux of their work. Later the authors introduce SDT and it may be helpful to explore literature using that model as well.

I believe we have now made a number of changes throughout the paper in accordance with review 1-4 comments, that address Reviewer 5’s concerns.

* Details regarding the development and content of the surveys are lacking. It appears as though the survey was purely for demographic reasons. If so, please ignore this comment, or at the most some rationale for what variables were consider may be helpful (a minor point that can be ignored).

Yes, the demographic information was collected in the survey.

* There is very little information regarding how the recruitment and enrolment of the 40 interviewers occurred. Very little information in provided about the how the interviews were
conducted as well. Again, how was the interview guide constructed, how was final content determined, was this an open or semi-structured interview, who conducted the interviews etc.

* Some details regarding conventions related to qualitative research are missing. For example, identifying epistemology, whether data collection was concurrent, iterative or after all data was collected, returning to the data after early analyses, memos, end points, etc. It appears it was all collected then analyzed. These should be described.

* To the point above, I don't think having only 13% of the interviewer pool is a problem assuming the end point for interviews was based on either information power or saturation. This is not described.

* A brief description of "framework analysis" may be helpful, particularly since the references provided are books.

* Again, to the points above, it is not clear if the analysis was inductive or deductive particularly after reading the statement "Emergent themes in the dataset appeared to resonate closely with key constructs of SDT. 5 Thereafter, SDT was used as a conceptual framework to identify recurrent themes. A coding framework was developed to code the entire dataset through the theoretical lens of SDT." The results suggest it was deductive, but I'm not certain. The theoretical framework is clearly beneficial. I just wondered what came first.

* I apologize if I missed it, but it wasn't until the results that I realized that focus groups were conducted (as per the heading - is this accurate). This should be described / discussed in the methods section. Perhaps we understand focus groups differently - I'm not certain.

* I wonder if it would be helpful to expand some quotes / results. For example, the quote "I think having someone who is an experienced GP being part of the interviewing is a good idea" provides little in understanding why. There are other examples. Overall the data is very descriptive rather than interpretive or constructivist - this may or may not be appropriate depending on the qualitative approach taken (see comments above).

* I wonder (and could concede) whether obligation and sense of duty were reflective of a "sense of relatedness". Not asking for a revision necessarily, just a point of reflection.

* I thought the discussion was well structured. However, I would suggest that for each dimension, the authors describe each based on the literature, and make more explicit what others have said about these dimensions (and their implications), then fit their results into that conversation.
* Was there anything in SDT that didn't appear in the results, that perhaps the authors were surprised about?

* Finally, as mentioned in the opening, it would be helpful if the authors could elaborate on what they believe these findings contribute either to SDT, MMIs as an admission process or motivation as a construct - extending beyond application to recruitment and retention. It would seem there is some potential to contribute in this way without over extending the results, discussion and conclusions.

I believe that all of these points have now been addressed in response to Reviewers 1-4 comments.

Minor

* Might suggest supporting the last line of paragraph 2 on page 3 with a reference.

Yes, this has been added in accordance with recommendations from Reviewers 1-4

* The head "surveys" suggest there was more than 1. How many were used?

This has now been changed to “survey”

* I would suggest moving the number of those interviewed to the results, or since its included in the result, removing it from the methods section.

Thank you, this has now been changed accordingly.

* The statement "emergent themes in the dataset appeared to resonate closely with key constructs of SDT" should be move to the results.

We feel this might be best to remain in the methods section, as it was part of the method we used in analysing the data.

* I would suggest that there are other limitation depending on how the methods are eventually refined (e.g., representativeness, saturation issues etc.).
Thank you, we have now added a number of additional limitations in accordance to recommendations from Reviewers 1-4.