PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Senior Medical Students as Assistants in Medicine in COVID-19 crisis: A realist evaluation protocol
AUTHORS	Monrouxe, Lynn V; Hockey, Peter; Khanna, Priya; Klinner, Christiane; Mogensen, Lise; O'Mara, DA; Roach, Abbey; Tobin, Stephen; Davids, Jennifer

VERSION 1 – REVIEW

REVIEWER	Denniston, Charlotte Monash University, Monash Centre for Scholarship in Health Education (MCSHE)
REVIEW RETURNED	07-Jan-2021

GENERAL COMMENTS	Thank you for the opportunity to review your realist evaluation protocol titled: Senior Medical Students as Assistants in Medicine in COVID-19 crisis. Abstract: Pg 3 line 19: You describe here that the study lasts 11 months (August- June), however on Pg 10 line 23/24 you state 7 months. Make sure this is consistent or describe the differences in what you have written. Pg 3 line 25: suggest describing what you are developing as an initial 'programme' theory instead of initial theory in order to align with the approach and language you have described in the body of the manuscript. Pg 3 line 54: I think this is meant to be 255 participants who will be sent the questionnaire not 55 participants (as per description on Page 10 lines 5-20). Introduction Great introduction. The description of the roles is generally succinct and clear. Page 4/5 line 58 (sentence over page): unclear what this sentence means in relation to the students of other health professions. What is tracked back to what? Page 5 line 6-10: very long sentence, suggest reorganizing to improve structure. Page 5 line 45-47: Sentence commencing 'Physician Assistant/Associates are found to be…' - does this need a reference? Page 6 line 36-40: This paragraph is a little unclear to me. When you are referring to the 'embedded sub research questions' are you referring to your practice informed CMOs, or your hypotheses

	and development of the initial programme theory? I can (kind of) see how this links to what you go onto describe in Step 1 of the synthesis, but it feels out of place or unsupported here. Suggest linking it to your detailed methodology description or removing it. Method Page 8 line 20 - 54: Thanks for the detail in your search. There is a spelling error in this table - I think Daliy is meant to read Daily (line 29). Can you please explain what 'extender*' is (line 6 in the Table)? What is your justification for including line 18 (i.e. pandemic related medical education articles)? Although your particular intervention was set up during the pandemic, the pandemic is not really the focus of your work. I agree that you would find relevant articles in this search (i.e. medical students roles during a pandemic), but the justification for including these articles (particularly for including them with an OR function in line 20) is not clear. A sentence justifying why this is part of your search strategy would be helpful. Page 9: The entire Realist Evaluation section is well written. The methods are clear and well justified. Page 11 line 47: Although Phase 1 and Phase 2 were very clearly articulated, Phase 3 requires some more detail. Particularly this opening paragraph (lines 48-56). Line 48: Why the shift to C+M+O instead of C-M-O? Suggest keeping it consistent. Line 49: Programme designers or Developers? Elsewhere you use Developers. Suggest keeping it consistent. Line 49: what are the actual outcomes of the initiative and how are these derived from your data? Are the actual outcomes the outcomes (and CMO configurations) described by your participants? I believe this is what you go on to describe on Page 12 line 9-13, but how it relates to this opening paragraph is unclear. Line 51: What is meant by 'will consider all types of information'? What types of information are normally not considered? Line 52: do you need a reference for data abduction? What does this mean? Page 12 Line 14-18: I am not sure this paragraph is relevant as it only describes what you might (or might not) do. Suggest removing. Page 12 line 39: Ethical approval to undertake not undertaking. Page 12 Line 40-43: The impact/outcomes described here are not really in line with how you have described the realist methodology in the rest of the manuscript. My understanding is that this realist evaluation won't necessarily give you information about the impact on the workplace, it is about discovering what worked about this program (or not) and for who and in which contexts/circumstances. This study will go further than developing an initial program theory, you would hope by the end you would have refined your program theory further. The phrasing in the abstract (page 3 line 38-40) about the outcomes of this work is phrased better than what is written in the manuscript. Suggest reviewing this final paragraph. Limitations: there is no mention of limitations in the manuscript, only in the abstract. References: the references are all appropriate, but there have been a number of pandemic medical education related references published towards the end of 2020, that warrant inclusion here.

	These may have been published after this article was submitted, but should be included now. I look forward to seeing the results of this work. All the best.

REVIEWER	Wiese, Anel University College Cork, Medical Education Unit
REVIEW RETURNED	27-Jan-2021

GENERAL COMMENTS	Many thanks for the opportunity to review this protocol. Overall, the protocol is well-written, clear, concise, and methodologically sound. I expect that this study will generate a rich, detailed, and highly practical understanding of the new 'assistants in medicine' programme. The findings will be valuable to improve the current model and to inform the planning of future initiatives. Below I outline some minor observations about the introduction section that could be considered for improving the manuscript. • The description of the assistant in medicine role is a bit vague. It would be useful to include more detail about the work students undertake, for example, what they can and cannot do, the supervisory structures, etc. • In the introduction, the authors also explained how two existing initiatives (assistantships and physician assistant/associate) relate to the new assistant in medicine role. The similarities between assistantship and assistant in medicine were clear and how assistantship challenges may be relevant to the assistant in medicine role. Did the authors consider including literature on sub-internships to inform the programme theory? Sub-internships as far as I know, have a lot in common with UK assistantships. • In the physician assistant/associate section, the rationale for likening this role to that of the assistant in medicine was not immediately apparent. I had to turn to other information sources to learn more about this profession's background and practice. Although the authors did describe a range of challenges physician assistants face, there was very little explanation of their work, how that is supervised, and how this may be relevant to the assistant in medicine role. I think it would help readers by explaining the similarities and differences regarding, for example, supervision, scope of practice, autonomy, and role negotiation which I believe would be relevant to this study and the development of an initial programme theory. It may also be a good idea to include a short section towards the end of the manuscript about potential risks/limitations of the chosen methodology and research design.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1	Response
Abstract: Pg 3 line 19: You describe here that the study lasts 11 months (August- June), however on Pg 10 line 23/24 you state 7 months. Make sure this is consistent or describe the differences in what you have written.	We use the time-span 7-months to refer to data collection. We have now clarified this.
Pg 3 line 25: suggest describing what you are developing as an initial 'programme' theory instead of initial theory in order to align with the approach and language you have described in the body of the manuscript.	The word 'programme' has been inserted
Pg 3 line 54: I think this is meant to be 255 participants who will be sent the questionnaire not 55 participants (as per description on Page 10 lines 5-20).	Thank you for your comment. We have a questionnaire for the 55 Assistants in Medicine and plan a second one for 200 Assistant in Medicine Supervisors and Team Members. As we are referring to the Assistants in Medicine here we have added 'Assistants in Medicine' before the word 'participants' to clarify this.
Introduction Great introduction. The description of the roles is generally succinct and clear.	Thank you
Page 4/5 line 58 (sentence over page): unclear what this sentence means in relation to the students of other health professions. What is tracked back to what?	We have now changed this to clarify the referent, as follows "As a result, the development of a sense of belonging and feeling like a doctor (i.e. their professional identity) may be delayed due to the lack of meaningful participation in professional activities."
Page 5 line 6-10: very long sentence, suggest reorganizing to improve structure.	We have now changed this from, "Students who report being supported, narrate their experiences in a markedly different manner, saying how this support eased their transition into their professional role, 'they felt it was 'business as usual' as they already understood how the system worked and what would be required of them once they became an F1 (PGY1)'. 24" to: "Students who report being supported, narrate their experiences in a markedly different manner to those who did not. Indeed, this support eased students' transition into their professional role, feeling it to be 'business as usual' due to their existing understanding of requirements and work practices for an F1 (PGY1).24"

Page 5 line 45-47: Sentence commencing 'Physician Assistant/Associates are found to be…' - does this need a reference?	Yes, we have now added the reference
Page 6 line 36-40: This paragraph is a little unclear to me. When you are referring to the 'embedded sub research questions' are you referring to your practice informed CMOs, or your hypotheses and development of the initial programme theory? I can (kind of) see how this links to what you go onto describe in Step 1 of the synthesis, but it feels out of place or unsupported here. Suggest linking it to your detailed methodology description or removing it.	Yes, we are referring to all the questions that come together to form the C-M-Os (especially the 'M' and 'O's, we have removed it as it is dealt with later.
Method Page 8 line 20 - 54: Thanks for the detail in your search. There is a spelling error in this table - I think Daliy is meant to read Daily (line 29).	Correction to Daily
Can you please explain what 'extender*' is (line 6 in the Table)?	A "physician extender" is another para-professional role. If you search on it in Google scholar you can see some examples. Example 1: https://www.verywellhealth.com/what-is-a-physician-extender-2615023
What is your justification for including line 18 (i.e. pandemic related medical education articles)? Although your particular intervention was set up during the pandemic, the pandemic is not really the focus of your work. I agree that you would find relevant articles in this search (i.e. medical students roles during a pandemic), but the justification for including these articles (particularly for including them with an OR function in line 20) is not clear. A sentence justifying why this is part of your search strategy would be helpful.	Thank you for your comment. We have now included the following explanation in our revision: "Note, we include the term 'pandemic' in our search strategy as the Assistant in Medicine role was implemented in response to the pandemic. The rational is to see if any other similar roles have been developed, or any equivalent use of senior medical students, during the pandemic and how they are being used."
Page 9: The entire Realist Evaluation section is well written. The methods are clear and well justified.	Thank you
Page 11 line 47: Although Phase 1 and Phase 2 were very clearly articulated, Phase 3 requires some more detail. Particularly this opening paragraph (lines 48-56).	We have now extended this section to read: "Phase 3, Analysis: The C-M-O configurations of intended outcomes will be examined against the actual outcomes of the Assistants in Medicine initiative. Intended outcomes will comprise those developed during the realist syntheses as well as data from initial interviews with programme developers. Actual outcomes will be derived from our data collected from the Assistants in Medicine themselves and those who work with them. Thus, all data will be managed in a single ATLAS.ti8 database. Working with the C-M-O codes developed, we

	will compare and contrast the intended outcomes and associated mechanisms and contexts between the two sets of data (intended versus actual) to establish what worked for who, how, and in what contexts. We will employ the process of data abduction[MOU1]. Abduction searches for an explanation of surprising results that are not readily explained by the initial programme theory. In doing so we will consider new hypotheses or general rules that might explain any given case. This is an iterative process whereby hypotheses/rules are considered, and data interrogated, until the expected results are discovered. Through this abductive process we will formulate theoretical explanations based on empirical observations, drawing heavily on existing social theory as we consider the range of mediators for our explanations."
Line 48: Why the shift to C+M+O instead of C-M-O? Suggest keeping it consistent.	Thank you. We have now standardised the notation to read C-M-O throughout.
Line 49: Programme designers or Developers? Elsewhere you use Developers. Suggest keeping it consistent.	Thank you. We have now standardised the terminology to read developers throughout.
Line 49: what are the actual outcomes of the initiative and how are these derived from your data? Are the actual outcomes the outcomes (and CMO configurations) described by your participants? I believe this is what you go on to describe on Page 12 line 9-13, but how it relates to this opening paragraph is unclear.	Thank you – this has now been clarified in our re-working of the section above: "Actual outcomes will be derived from our data collected from the Assistants in Medicine themselves and those who work with them"
Line 51: What is meant by 'will consider all types of information'? What types of information are normally not considered?	This has now been omitted in the re-working of this section as it actually referred to Phase 1 of the study.
Line 52: do you need a reference for data abduction? What does this mean?	We have now clarified this in our re-working of the section and added a reference accordingly
Page 12 Line 14-18: I am not sure this paragraph is relevant as it only describes what you might (or might not) do. Suggest removing.	We think you for this suggestion. However, we would like to keep it in so have been firm in our assertion as follows: "In-depth narrative analysis of selected illustrative data sets will be conducted to shed further light onto our topic of inquiry". We have also removed the caveat of it

	being data dependent but retain the one around sufficient resources.
Page 12 line 39: Ethical approval to undertake not undertaking.	Thank you, we have amended this.
Page 12 Line 40-43: The impact/outcomes described here are not really in line with how you have described the realist methodology in the rest of the manuscript. My understanding is that this realist evaluation won't necessarily give you information about the impact on the workplace, it is about discovering what worked about this program (or not) and for who and in which contexts/circumstances. This study will go further than developing an initial program theory, you would hope by the end you would have refined your program theory further. The phrasing in the abstract (page 3 line 38-40) about the outcomes of this work is phrased better than what is written in the manuscript. Suggest reviewing this final paragraph.	We respectfully disagree with the reviewer on this point, but think this is because they are thinking about 'hard' numbers perhaps – whereas we are considering narrative reports and the C-M-Os we develop. For example, anticipated positive impact on the workplace includes improved service delivery, clinicians and junior medical officers working to their full capacity. There are likely to be negative impacts (e.g. time for supervision). It is these we are referring to. We have now amended this to clarify as follows: "The outcomes of this study will inform programme developers of the impact that the Assistants in Medicine initiative has on the workplace (i.e. as identified in the Outcomes of the C-M-O configurations)."
Limitations: there is no mention of limitations in the manuscript, only in the abstract.	Given there is a specific strengths and limitations section at the beginning of the manuscript we feel this would be too much repetition. We are happy to include it at the end if the editor wishes.
References: the references are all appropriate, but there have been a number of pandemic medical education related references published towards the end of 2020, that warrant inclusion here. These may have been published after this article was submitted, but should be included now.	We do not include these as we failed to find any that are specific to the work we are undertaking in terms of senior medical students being deployed for service-related activities.
Reviewer 2	
The description of the assistant in medicine role is a bit vague. It would be useful to include more detail about the work students undertake, for example, what they can and cannot do, the supervisory structures, etc.	Thank you for this request. However, it is not straightforward as it does differ according to the specific assistantship placement and the abilities of the student. We have tidied up the description slightly but depending on where the student starts from and the specialty in which they are placed this is the role as defined by the General Medical Council and as we state in the

	manuscript, students are: “integrated into a healthcare team for the last few months of their clinical training to gain phased-in hands-on experience carrying out the work of a newly qualified doctor under appropriate supervision” We have also included greater clarity around how the Assistants in Medicine and Assistantships are similar and different: “*Assistantships* in the UK are medical students who, via a longitudinal full-time placement, are integrated into a healthcare team for the last few months of their clinical training to gain phased-in hands-on experience carrying out the work of a newly qualified doctor under appropriate supervision.[2-5 21] Thus the timing of Assistantships is the same as the Assistants in Medicine. Similar to Assistants in Medicine, Assistantships differ in length from 3-6 months and they can be undertaken in the hospital where students will eventually be appointed.[5 6] However, unlike Assistants in Medicine, some Assistantships are aligned with the exact role to which they are about to transition.[5 6] The purpose of this Assistantship role is to smooth the transition from being a student to being a professional,[22] hopefully easing their passage into a professional role by gradually preparing them for the responsibilities they will face as a junior doctor.[2 23 24] This purpose is only partly aligned with that of the Assistants in Medicine, as their key purpose is to provide assistance should junior medical officers be otherwise deployed (so they are there to fill a service gap).”
In the introduction, the authors also explained how two existing initiatives (assistantships and physician assistant/associate) relate to the new assistant in medicine role. The similarities between assistantship and assistant in medicine were clear and how assistantship challenges may be relevant to the assistant in medicine role. Did the authors consider including literature on sub-internships to inform the programme theory? Sub-internships as far as I know, have a lot in common with UK assistantships.	We thank the reviewer for highlighting the literature of sub-internships of which we were previously unaware. With further investigation we feel that while there is some crossover in the literature, the limited time-span of a few weeks rather than months restricts the similarities between the two. We will, however keep on the lookout for this, and any other initiative that might be an appropriate comparator.

In the physician assistant/associate section, the rationale for likening this role to that of the assistant in medicine was not immediately apparent. I had to turn to other information sources to learn more about this profession's background and practice. Although the authors did describe a range of challenges physician assistants face, there was very little explanation of their work, how that is supervised, and how this may be relevant to the assistant in medicine role. I think it would help readers by explaining the similarities and differences regarding, for example, supervision, scope of practice, autonomy, and role negotiation which I believe would be relevant to this study and the development of an initial programme theory.	We thank the reviewer for their suggestion – we have information on scope of practice and autonomy. "While both the Physician Assistant/Associate and Assistant in Medicine roles are paid positions, both filling a service gap, there are differences between the roles. For example, the Physician Assistant/Associate is full time, does not include integrated study time and, the role will not lead to the position of a physician or open a career pathway to further progression or result in autonomy of practice. Furthermore, Physician Assistant/Associates are interdependent, semi-autonomous clinicians practising in partnership with physicians whereas Assistants in Medicine work under clinicians' supervision."
Limitations It may also be a good idea to include a short section towards the end of the manuscript about potential risks/limitations of the chosen methodology and research design.	See above.