Reviewer's report

Title: A typology of uncertainty derived from an analysis of critical incidents in medical residents: A mixed methods study

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Reviewer: Anne Kawamura

Reviewer's report:

General:
This paper addresses an important aspect of medical practice – uncertainty. The authors outline several existing typologies of uncertainty from the literature that were derived from a variety of disciplines, some from outside of medicine. They use mixed methods to add to this literature by analyzing a set of critical incidents described by family medicine residents.

Major Compulsory Revisions
1. In the methods, qualitative phase, sample paragraph: The authors state that 31/159 reports were removed from analysis “because their reports did not provide any useful information”. On what basis were these reports removed? Were there specific criteria used to determine which reports were included and which were excluded?
2. In the results, typology of uncertainty section: The authors assert that two new types of uncertainty were identified from their analysis that could extend Beresford’s classification. While there are descriptions of two CIs that “fit” these new types, no other data is presented to support their “extended” typology.

Minor Essential Revisions
3. In the discussion, paragraph 3: The authors refer to “Figure 1”, however this was not included in the documents provided.

Discretionary Revisions
4. In the background section, the authors very nicely outline multiple existing typologies of uncertainty. What is unclear is why this study is needed, as these typologies exist. The paper could be strengthened by articulating what is lacking in the current typologies and why this study was undertaken.
5. This was an ambitious study with four distinct objectives identified. The third objective: “a new instrument will be presented that allows large-scale assessment of the strategies that medical residents apply to unexpected CIs in real situations” – seems like it could be a separate paper on its own. If the authors choose to publish the instrument in another paper, they could expand on how the instrument was developed and describe validity evidence for its use.
6. In the discussion, paragraph 10: The authors make a distinction between their questionnaire and others developed previously in that theirs asks respondents to report on actual situations rather than hypothetical ones. At the end of this
paragraph, the authors state that their approach allows them to study how residents “actually deal with uncertainty in professional situations”. Their questionnaire however still asks residents about their perspective on what happened and may not necessarily reflect what truly occurred. An observational study would allow them to be able to accurately document actual events.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests below