Reviewer's report

Title: Electronic Health Records in Outpatient Clinics: Perspectives of Third-Year Medical Students

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Reviewer: Peter Embi

Reviewer's report:

General
The authors have performed a survey of medical students at one institution that highlights students' perceptions of EHR-use and its impact on certain educational activities. As the authors point out, this is an area that has received relatively little attention in the literature and they do a good job of positioning their contribution in this context. Their findings add to the limited literature in this arena and should be of interest to those involved in educating medical students in the EHR-era.

Having said that, there are some adjustments and additions that I feel would strengthen the manuscript and would help to clarify the meaning of the findings described; I have outlined these in the sections that follow.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

The following comments relate to various sections of the manuscript and are presented in the order in which their respective sections appear in the manuscript.

Under survey design, the authors indicate that they conducted a focus group to inform survey development and present the thematic findings that emerged. Has this thematic analysis been presented elsewhere? If so, a citation should be added. If not, then a bit more description of what underlies these themes, including categories and representative comments as well as a bit more about how the focus group was conducted/analyzed should be added. A table could suffice for much of this.

If available, please include more detail about how many/which respondents used tablet or desktop as this may have significant impact on their responses and reporting this and/or breaking out results according to this parameter would be informative.

Need more detail as to the EHRs capabilities, the use of particular clinical decision support features, etc. As I’m sure the authors recognize, one EHR implementation doesn’t equal another EHR implementation, even using the exactly the same EHR software. So, in order to put the findings into the
appropriate context and draw appropriate conclusions about these students' impressions of how EHR vs. Paper-based records impacted their questioning of patients, thought processes, etc. we must know more about both the paper-based and EHR-based interventions/procedures. There seems to be a disconnect in the manuscript with regard to this point. In the methods section, there is the suggestion is that there were no alerts/tools used given the mention of “limited” data being presented at the time of the study. However, in the discussion, mention of “prompts” and “alerts” are included. It would strengthen the report to mention, in particular, did the system deliver/students experience prompts/alerts? What were they? How were they used? Did they appear for the physician and the student or just the student? What about the Paper charts? Did they use any paper-based decision support tools in the environments where these students practiced?

Did the questionnaire explicitly ask the students to compare EHR to paper? Presenting the full questionnaire as a figure/table would be helpful. If the questions are exactly as written in current Table 1, then state so and refer to the table under the study design section.

Results:

As the authors note, the response rate, though good for such a population, leaves open the possibility that responders and non-responders differed somewhat. To address such concerns by readers, please indicate what if anything was different about those who responded vs. those who did not. Important factors might include ultimate specialty preference if known, gender, reported experience with computers at time of survey if known, etc. If possible, a typical “Table 1” describing the demographics, etc. of the student-subjects would be useful.

Regarding “feedback received” question, was this specified as feedback from supervisors? Having the full survey questions included would cover this and other questions related to the meaning of questions/answers.

Although narrative comments were reported as being “too few” to perform thematic analysis, the proportion of respondents submitting them should be reported. Also, the comments should be presented, even if paraphrased, perhaps in a table.

Discussion:

In the discussion, it is important to re-phrase comments as “reportedly”. For instance, the authors state that, “Our EHR interface contains icons for Internet and patient education materials, yet our students mostly ignored them in the midst of other activities.” This would be better stated as the students reported not using them more often. The question did not ask if they “ignored” these tools and they may have not used them despite attending to them. Perhaps they found them unnecessary or likely to be unuseful. Moreover, it is possible they did use them and just reported they did not. Direct observation or
query of the EHR system for access events would be the “gold standard” for determining whether they were actually used.

“Thus, the low reported use of such resources may simply reflect a developmental learning process. If the students had used the EHR for longer than 12 weeks, they may have learned to incorporate more online resources into point of care encounters.” Of course, this may not be true. It would be useful to cite any knowledge the authors have that physicians who have been in practice longer and have been using the EMR in fact do use such resources more often. Specifically, did the students’ mentors use such resources? Students often follow their teachers’ lead in this regard. Is anything known about attending physicians’ use of such features at the authors’ institution? In addition, any literature regarding the usage level of such resources by physicians who have been in practice for a while would be of interest. Also, the authors should indicate if the educational intervention specifically addressed the use of these features? If so, that should be included in the description of the orientation session, including how their use was mentioned/encouraged.

In addition to the comments above about clarifying the use of alerts, discussion around the impact of alerts on student “ordering” would also benefit from some clarification. In certain schools third year medical students are not able to enter orders using EHRs at all, while at others they can enter them and then have them co-signed. I assume based on the report that the case in this medical school is the latter. However, clarification of whether students can place actual “orders” in this environment or whether they suggest to the precepting physician which orders they “would” order, but leave the ordering to the preceptor is worth including. If the latter is the case, then the question about the impact of EHRs on student “ordering” activity may underreport the actual impact of such alerts as some may have not reported a change to their ordering habits even if it did cause them to consider changes should they have that authority. Here again, having the actual survey question presented is important, although the results may still be difficult to fully interpret. That’s okay, but more discussion about the other possible meanings and limitations may be warranted.

Limitations section:
While the content and face validity may be good, content of questions and how they are written/interpreted requires a different level of expertise than does coming up with what are the important topics.

The authors should probably also mention here the fact that these findings are simply reported findings from a survey, and that as with any self-reported findings, actual usage/experience data as could be obtained through other methods like direct observation or querying of the system may result in different findings.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
Discretionary Revisions (which the author can choose to ignore)

Great point about the importance of the “feedback finding”. A citation to support the “paucity” statement would be nice.

**What next?:** Accept after minor essential revisions

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

**Quality of written English:** Acceptable

**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