Novel use of a Portable Medical Database Improves Medical Student Clinical Learning Experience during a Global Health Rotation in Tena, Ecuador

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Introduction:

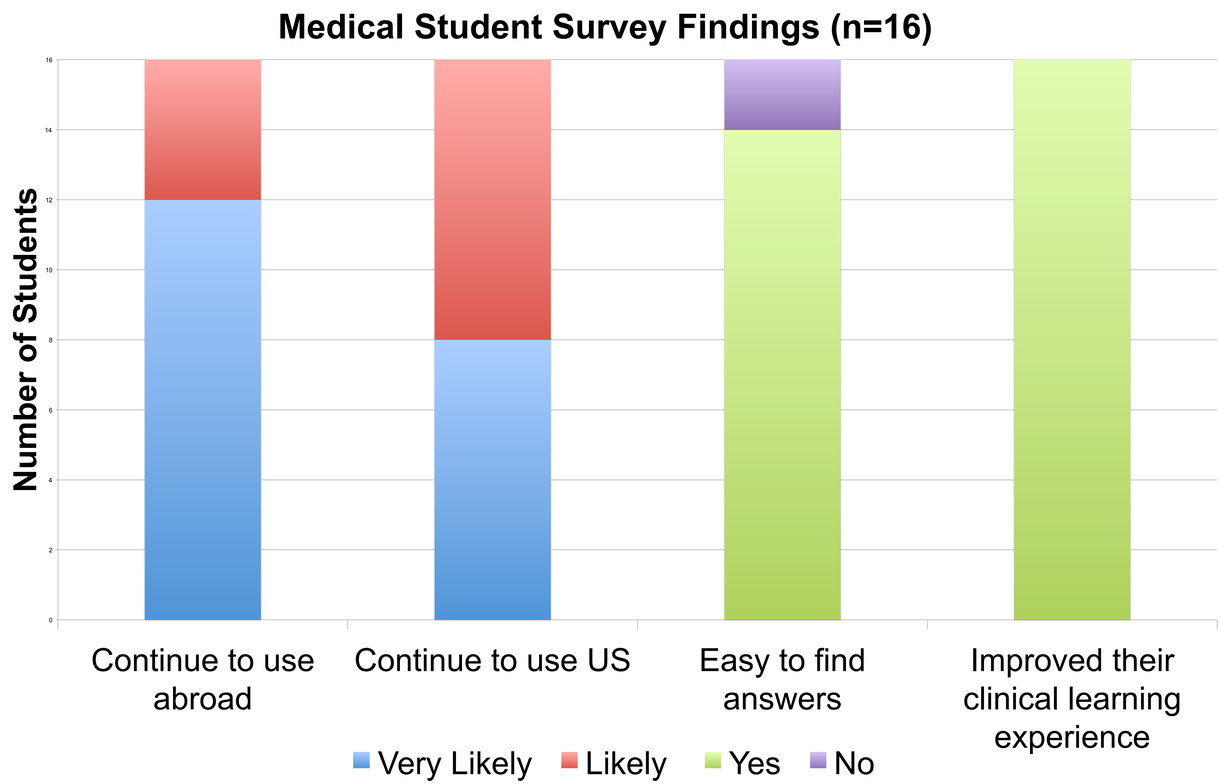
Two seemingly conflicting trends are emerging among medical students: they are avid high-tech learners [1] and they consistently seek out global health electives in low resource areas[2, 3].

- There is very little research into what information sources medical students use for clinical learning while on global health electives.
- PEMSoft Portable is an evidence-based electronic point-of-care application (app) that can function on the native memory of a smart phone or tablet. PEMSoft Portable, written in English and originally designed to provide current evidence-based pediatric decision support in emergency departments in developed countries, has been found to be very useful to physicians not primarily English-speaking in low income countries [4].
- Kids Care Everywhere, a California nonprofit charity, donated software licenses for PEMSoft Portable to second year medical students from University of Louisville School of Medicine for use during a global health rotation in the Amazon Basin, Tena, Ecuador.
- We hypothesized that using PEMSoft Portable would improve the perceived clinical learning experience of the medical students.

Methods:

- Students downloaded PEMSoft Portable to their personal mobile devices prior to departure and completed baseline surveys on comfort with technology and baseline use of current sources of clinical information.
- Students participated in running 8 rural clinics over a 2 week period in the area surrounding Tena, Ecuador, where they helped provide primary care services to over 1100 patients of all ages.
- For the first half of the rotation, students were not allowed to use PEMSoft Portable, but could use any other clinical resource.
- Half-way through, students were trained on the use and navigation of PEMSoft Portable and were also able to use this tool during clinic.
- Students completed daily shift surveys describing the topics they used in PEMSoft Portable for clinical learning.
- Student were surveyed at the mid-point and upon completion of the rotation about their clinical learning experiences.
- Data from the surveys was compiled into an Excel document and analyzed for trends.

Figure 1:



Discussion:

It is clear from the data that the medical students believed that PEMSoft Portable, a point-of-care evidence-based medical app, was easy to use and improved their clinical learning experiences. This is a potentially groundbreaking discovery, because many medical student are traveling to low-income countries and engaging in early clinical experiences. US medical students are accustomed to online resources to aid them in their learning, but these resources are rarely accessible in the low-income world--where there is often no electricity, and there is extremely limited internet access. A majority of the subjects planned on continuing to use PEMSoft Portable in their future global health trips to the low-income world, in addition to using PEMSoft Portable in the US. These results show that medical students desire point-of-care, evidence-based medical apps while working in both clinics aboard and in the US.

From this limited trial, our results strongly suggest that there may be a simple way to improve the clinical learning experience of students in challenging medical settings at home and while traveling to low-income countries. While this study had a small sample size, it still demonstrates that students find a portable point-of-care referencing tool enhances their learning. Other limitations and possible confounders include lack of diversity in the medical students' level of training and variabilities in the number and types of medical conditions, and patient age groups that each medical student encountered. Further studies of medical apps should be done to evaluate their impact on student learning, vis-à-vis different levels of medical school training, length or location of global health experiences, or types clinical problems encountered while working abroad.

Results:

- Compiled data from the post surveys showed that. 100% of the subjects thought it was "likely" or "very likely" they would continue to use PEMSoft Portable during future clinical rotations in the United States.
- 100% of the medical students also thought it was "likely" or "very likely" that they would continue to use PEMSoft Portable during future global health rotations.
- 87.5% of the subjects said they would definitely recommend PEMSoft Portable to a friend planning a global health elective.
- The data from the daily shift surveys revealed that 92% of the time the medical students thought PEMSoft Portable improved their clinical understanding of the Patient/Condition on a day to day basis.
- 87.5% of the medical students said it was easy to find answers to their clinical questions when using PEMSoft Portable
- Finally, 100% of the medical students said on the post survey that they believed that PEMSoft Portable improved their overall clinical learning experience.

References:

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3. Brewer, T.F., N. Saba, and V. Clair, *From boutique to basic: a call for standardised medical education in global health.* Med Educ, 2009. **43**(10): p. 930-933.

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