

Experiential Learning at a Student-Run Free Clinic is Associated with Improved Performance on the Clinical Interviewing Skills Exam

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Abstract

Objective: To assess how medical student participation in a student-run free clinic impacts learning the core competencies of clinical decision making.

Context: Student-run free clinics provide experiential learning for future health professionals through clinical skill building and professional development. Measuring the impact on medical student education is necessary to assess the effectiveness of this pedagogical model. The CommunityCare Clinic (CCC) serves the primary, preventive, and tertiary health care needs of uninsured and underserved adults in Toledo, Ohio.

Methods: All first year medical students ($n=177$) at the University of Toledo College of Medicine and Life Sciences were emailed a 22-item electronic survey. Test-retest reliability ($r=.90$, $p<.001$) and internal consistency of the instrument (Cronbach's $\alpha=0.74$) were strong. Student examination scores on the clinical interviewing skills exam in the Clinical Decision Making I course were reported and compared to number of CCC volunteer hours reported. Student confidence level on the Accrediting Council for Graduate Medical Education competencies in clinical interviewing skills were also compared to hours volunteered at CCC.

Results: An independent samples t-test compared high scorers on the clinical interviewing skills exam (those who scored above the 50th percentile) to low scorers on number of hours spent volunteering at CCC. There was a statistically significant difference ($t(45)=2.5$, $p=.018$) in number of hours volunteered between high scorers ($M=21$, $SD=7.4$) and low scorers ($M=15$, $SD=7.9$). There was no statistically significant relationship between clinical interviewing self-confidence rating, score on the clinical interviewing skills exam, and number of hours volunteered at CCC.

Conclusion: The results of our study suggests a positive relationship between the number of hours volunteered at a student-run free clinic and subsequent scores on the clinical interviewing skills exam. This survey is an adaptable assessment that can be applicable to other institution's evaluation of experiential medical education. Further investigation into appropriate examination tools for assessing experiential learning is necessary.

Introduction

Student-run free clinics provide valuable experiential learning opportunities for students of the health professions.^{1, 2} While existing research indicate student-run free clinics play a meaningful role in building clinical skills and promoting professional development,³ quantitative and qualitative measures of student-run free clinics is currently lacking. Medical education is shifting from the traditional, didactic classroom pedagogy toward medical simulation and experiential learning.^{4, 5} Student-run free clinics provide self-directed medical students a chance to cultivate skills in a professional setting and reinforce concepts learned in the classroom. Volunteering at a student-run clinic provides students of the health professions an opportunity to contribute meaningfully to patient care during a time in their medical education where opportunity for personal skill development is limited. Measuring the impact these free clinics have on medical students' skill development is necessary to assess the effectiveness of this pedagogical method.

The CommunityCare Clinics (CCC) organization at The University of Toledo College of Medicine and Life Sciences provides students with the extracurricular opportunity to participate in an experiential learning model. The CCC, established in 2011, is a student-run free clinic dedicated to providing healthcare for the uninsured. It unites students and healthcare providers from diverse disciplines in a common vision of translating inter-professional teamwork into enhanced, comprehensive patient care to address the multi-faceted needs of the

community. CCC is an evening walk-in clinic that operates weekly to provide primary care services to low-income families lacking health insurance in the greater Toledo area. Additional services include pharmacy, women's health, social work, physical and occupational therapy, HIV testing, and influenza vaccination.

Methods

All 177 first year medical students at the University of Toledo College of Medicine and Life Sciences were emailed a 22-item electronic questionnaire in May of 2015 using Qualtrics software. Qualtrics is an online data collection tool. The product is compliant with HIPAA and uses Transport Layer Security encryption for all transmitted data. Two experts in medical education and two experts in survey design guided the questionnaire structure to help ensure content validity. Students reported the number of hours they had ever spent volunteering at the CCC along with their scores on the clinical interviewing skills exam taken during the Clinical Decision Making I course. Students also rated their clinical interviewing skill confidence level based on the competencies set forth by the Accrediting Council for Graduate Medical Education (ACGME). Additional survey items asked students to select the three medical specialties of most interest to them and identify perceived barriers to volunteering at the CCC.

To establish test-retest reliability of the instrument, a sub-sample of 10 first year medical students completed the questionnaire on two occasions separated by 7 days. These 10 students were instructed to refrain from

subsequent participation in the study. The test-retest (stability) reliability for self-reported volunteer hours was excellent ($r = .90, p < .001$). The scale gauging self-confidence in clinical interviewing skills showed good internal consistency reliability (Cronbach's $\alpha = 0.74$). To investigate the impact of CCC volunteerism on clinical interviewing skill, participants were split into high-scorers and low-scorers using the median score on the clinical interviewing skills exam as a midpoint. We incentivized participation in this study by offering respondents a drawing for one of ten \$25 Amazon gift cards. The research protocol was approved by the Biomedical Institutional Review Board at the University of Toledo College of Medicine and Life Sciences.

Results

We received 67 surveys for a response rate of 38%. Participants were evenly split by gender and predominantly white. Table 1 depicts the demographics of the sample. The mean number of hours volunteered at CCC was 19 hours, corresponding to about two clinics time. Volunteer hours varied by medical specialty of interest and ranged from 120 hours to 0 hours. Medical students with an interest in Pediatrics reported the highest mean volunteer time (Table 2). Additionally, the majority (70%) reported they had previously worked with individuals in poverty or belonging to underserved communities.

Several barriers to increased volunteerism were reported. Lack of time was the most frequently cited barrier to increased participation in CCC (Table 3). We used an

Table 1. Demographics

	N	Total (%)
<i>Sex</i>		
Male	34	51%
Female	33	49%
<i>Race</i>		
White	46	69%
Asian	13	19%
Black or African American	3	4%
Hispanic or Latino	1	1%
Other	4	6%

Table 2. Top five medical specialties of interest and number of volunteer hours

Specialty	Volunteer hours (mean)
Pediatrics (n=13)	27
Internal Medicine (n=23)	22
Emergency Medicine (n=16)	21.5
Family Medicine (n=13)	16.5
Orthopedic Surgery (n=12)	12.5

Note. Participants chose up to 3 medical specialties out of 19 listed.

Table 3. Most common barriers to volunteering at the free clinic

Barrier	N
Time commitment	55
Not scheduled to volunteer	19
Unaware how to volunteer	7
Not interested	1

Note. Participants chose all that applied from a list of four common barriers.

independent samples t-test to compare high scorers on the clinical interviewing skills exam (those above the median score) to low scorers (those below the median) on number of hours spent volunteering at CCC. We found a statistically significant difference in number of volunteer hours between students who scored high (M=21, SD=7.4) and those who scored low (M=15, SD=7.9); $t(45)=2.5$, $p=.018$ (Table 4). There was no statistically significant relationship between number of hours volunteered at CCC and level of self-confidence in clinical interviewing. Self-confidence in interviewing skill was also not statistically significantly related to clinical interviewing skill exam scores.

Discussion

This study introduces a method for tracking and assessing the quality of experiential education for a variety of pre-clinical learning objectives. Students who score higher on the

clinical interviewing skills exam reported volunteering more hours at CCC. This likely results from the supplemental exposure and practice students receive at CCC outside of the regular medical curriculum. Focus should be on encouraging all students, no matter their specialty interest, to volunteer more at student-run free clinics like CCC.

Documentation and interviewing skills are essential, crosscutting competences to master in the healthcare profession, regardless of medical specialty chosen. Progress is being made in teaching clinical skills thanks to medical school administrative support of CCC and the recognition by faculty that time spent at CCC improves clinical skills. A focus on the practice environment with physician supervision provides an efficient framework to translate the medical information retrieved from the patient interview and objective findings on exams into the causation of disease and subsequent treatment modalities. Using this model incurs benefits on the community as well as medical education.³

Table 4. Mean Volunteer Hours for High and Low Scorers

	Exam Performance*			
	High	Low	<i>t</i>	<i>df</i>
Volunteer Hours	21	15	2.5**	45
	SD=7.4 ***	SD=7.9 ***		

Note: *Median sample exam score was used to categorize clinic volunteers into high vs. low performance.

** = $p = .018$

***SD = standard deviation

The lack of positive correlation between confidence in interviewing skills and hours volunteered at CCC may reflect a lack of general experience in performing the skills among medical students. Students may interpret their mistakes as a lack of improvement, and therefore a lack of confidence, simply because this is the first time they are learning the skills. Furthermore, the students in this study only practiced these skills for a few months. While the extra practice at CCC helped improve their score, it may not have been enough practice to improve students' own

perception of their skills. Furthermore, many students have some form of clinical exposure prior to medical school that may have affected their performance on the exam. The exact influence is unclear, particularly whether the more recent experiences at CCC or any past experience had a stronger impact on the score. However, the close similarity between interviewing and documenting a patient experience at CCC and the clinical interviewing skills exam makes CCC's impact stronger.

Improving volunteer rates remains a central focus of student run free medical clinics. Medical students in this study reported time as the number one barrier to volunteer. Incentivizing experiential learning with elective credit may motivate students to take the extra time to volunteer. At the University of Toledo College of Medicine, students may qualify for service learning electives by volunteering at CCC at least three times throughout the semester. Administrators recognize the importance of practicing skills introduced in the Clinical Decision Making I course and students have an appropriate incentive to devote extra time in a meaningful way.

The results of the present study established a relationship between the number of hours volunteered at a student-run free clinic and higher scores on the clinical interviewing skills exam. This survey is an adaptable assessment that can be applicable to other institution's evaluation of experiential medical education. Further investigation into robust evaluation tools for assessing free clinic-based experiential learning is needed.

Limitations

The data presented represents perceptions from medical students at a single institution and may not accurately reflect the opinions of all medical students. The extent to which any survey does not reach 100% response rate increases the amount of non-response bias present. Self-reported data may contain bias. To address this limitation, the instrument included a social desirability scale to gauge truthfulness. This study employed a cross-sectional design making causality difficult to ascertain.

Furthermore, while the study gauged the amount of prior experience working with underserved populations, the particular types of practice were not assessed. Experiences that may have had a confounding effect on the clinical interviewing skills exam include any activity requiring proficient documentation and interviewing skills like scribing, working in another healthcare profession prior to medical school, and previously volunteering in student run clinics.

Reflections on the Research Process by the First Author

First year medical students covet the limited practical experience they gain outside the classroom. Those moments are few and far between the time spent in the library studying for systems' exams and Step 1. However, at the University of Toledo College of Medicine (UTCOM), pre-clinical students have the opportunity to volunteer at the CommunityCare Clinic (CCC), a student-run free medical clinic that serves the underserved population in the area. Students across

all healthcare disciplines form teams to interview patients and address their medical problems with providers.

As an officer of this organization, I was interested in quantifying the value of a student's experience at this type of clinic to prove its importance early in medical education. The challenge seemed daunting because of the extreme variability between clinics, students, and patients seen. The skills practiced by one student at a given clinic could greatly differ from another student attending the same clinic. Despite this recognition, two skills seemed to consistently permeate each student's experience: patient interview and note documentation. Every patient required a completed subjective, objective, assessment and plan ("SOAP") note for their file and the medical students often completed them.

Accordingly, every first year medical student at UTCOM had to complete a clinical interviewing skills examination that consisted of a focused patient interview followed by a graded subjective history of present illness note. The overlap of this exam with the extracurricular practice at CCC was the perfect opportunity to collect calculable data from a subjective experience. At first, I wanted to strictly compare scores on the exam to hours volunteered at clinic, but after recognizing the difficulty in obtaining all the scores in light of the Family Educational Rights and Privacy Act (FERPA), I resorted to self-reported data in the form of a survey.

Recognizing my limited experience in statistics, data analysis, and survey design, I

fortunately met Professor Philip Welch from Bowling Green State University who taught me how to strengthen a survey using test-retest reliability and subsequently, how to organize large sums of data. While considering the limitations of a survey, we found a statistically significant relationship between the number of hours volunteered at a student-run free clinic and higher scores on the clinical interviewing skills exam. I now have a foundation to continue investigating and clarifying the role free medical clinics play in a preclinical student's education.

Works Cited

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