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Brief Report

The Clerkship Pediatric Rotation: Does Setting Matter?

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Abstract

Background: Medical student Pediatric rotations in Community Settings (CS) are increasingly common. The purpose of this paper is to assess the impact of setting (CS vs. exposure to an Academic Health Sciences Center (AHSC)) on the following: Clinical Performance, Examination Performance, Written Assignment Performance, and Successful Matching to a Canadian Pediatric Residency Program.

Method: 340 medical students from the University of Toronto, Canada were studied. Rotation performance and acceptance into a Canadian pediatric residency program were assessed in relation to pediatric clerkship rotation site, while controlling for pre-clerkship career preference and pre-rotation site preference.

Results: 172 medical students completed rotations that included exposure to an AHSC, while 168 medical students had exclusive exposure to a CS. Community based students received slightly higher clinical evaluations ($p < 0.01$), but not exam marks ($p = 0.81$) nor written assignment marks ($p = 0.09$). Students who had expressed career interest in pediatrics prior to clerkship performed better regardless of site ($p < 0.001$) and were more likely to choose an AHSC ($p = 0.05$). Clerkship setting had no demonstrated impact on successful matching to a Canadian pediatric residency program ($p = 0.17$).

Conclusions: These results help validate the community setting for clerkship training in pediatrics and the shift toward distributed medical education.

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Introduction

It may not be feasible to find appropriate clinical resources within an academic health center to accommodate all medical students requiring clerkship placement. Moreover the setting of a tertiary care pediatric center in a highly sub-specialized environment may not be the most appropriate learning environment for students who must first learn about common medical conditions affecting children. These considerations have been used to justify the shift to community pediatric settings as teaching sites. However, students may be unfairly advantaged by one type of rotation site over another. This issue is of particular importance to medical students considering a future career in pediatrics as well as curriculum committees attempting to ensure consistency between educational experiences.

Limited research has been done to address this area of uncertainty in medical education however four studies examining pediatric clerkship rotations in the community were found that best address the area of interest. A recent study from Dalhousie University in Nova Scotia, Canada investigated medical students placed in a Community Practice Setting (CS) vs. an Academic Health Sciences Center (AHSC) finding that there was no difference in end-of-rotation examination performance or Objective Structured Clinical Examination (OSCE) performance.¹ Similar studies have examined educational outcomes including end-of-rotation examination performance and USMLE scores, for which there have been no differences found between students placed in CS vs. AHSC.^{1,2,3} McCurdy et al., however, did find that students placed in CS encountered a heavier case load⁴. None of these studies assessed the impact of rotation site on achieving a pediatric residency position. Previous studies may also be limited in their interpretation as they did not take into account the potential confounders of pre-rotation site preference nor pre-clerkship career choice.^{5,6,7}

The aim of this study was to assess the impact of clerkship site (exclusive CS vs. some exposure to an AHSC) on the following educational outcomes within the context of the pediatric clerkship rotation: 1. Clinical Performance; 2. Examination Performance; 3. Written Assignment Performance; and 4. Successful Matching to a Canadian Pediatric Residency Program.

These outcomes were assessed while controlling for the following potential confounders: 1) Pre-clerkship career preference and 2) Rotation site preference as expressed by each medical student prior to the start of the rotation.

Methods

The Faculty of Medicine at the University of Toronto is one of Canada's largest medical schools and provides a four-year medical degree consisting of two years of pre-clerkship studies (primarily lecture based) and two years of clerkship studies (primarily clinical). Each year approximately 200 third year medical students participate in a six week pediatrics rotation as part of their clinical clerkship year. While this rotation was historically at the Hospital for Sick Children (HSC) (Toronto's tertiary care children's hospital) recent changes have incorporated community practice settings into the clerkship curriculum.

The Exposure

Currently students have one of two placement options: 1) Six weeks entirely in the community (inpatient and outpatient setting) or 2) Three weeks in an academic health sciences center (HSC) and three weeks in a community pediatrician's office. The clinical experience via exposure to the academic health sciences center (The Hospital for Sick Children) may be an advantage, no advantage or even a disadvantage in terms of the influence it may have on the performance and indeed the career of medical students.

For both groups, didactic teaching by faculty within the Department of Pediatrics occurred at a centralized location (often HSC) on a weekly basis. Medical students were excused from their clinical duties in order to attend these sessions. The clerks' performance was evaluated through a final examination, a clinical evaluation and submission of a written assignment (a case write-up detailing a patient encounter in which a lifestyle issue such as nutrition, physical activity, alcohol, tobacco or another drug is implicated). Verbal feedback was given from the student's clinical preceptor and there was an opportunity for the student to provide anonymous written feedback on the rotation.

The graduating classes of 2007 and 2008 were studied ($n = 340$). The first choice career preference of students

in their first and second years of medical school (pre-clerkship) was assessed through a previously administered national career survey entitled "How Medical Students Choose Their Careers". Given that students *with a career interest in pediatrics* might choose one clerkship exposure over the other, the survey response (career preference for pediatrics, a binary outcome) was used to control for the possibility of confounding. It may be that career preference for pediatrics was a greater predictor of successful outcomes than was the exposure to the clerkship site. Pediatric clerkship rotation site preference as expressed by each medical student prior to the start of the rotation and final rotation site were obtained through the Faculty of Medicine, University of Toronto. Rotation performance was based on three components: 1) Clinical assessment (a subjective evaluation by faculty preceptors) 2) Written examination mark (administered to each student at the end of their six week pediatrics rotation) and 3) Written assignment mark (a subjective evaluation by a faculty member based on a standardized marking scheme). Performance results were obtained through the Faculty of Medicine, University of Toronto. Acceptance into a Canadian pediatric residency program was assessed using pediatric residency admission records for 2007 and 2008.

Statistical Analysis

Data from 2007 and 2008 were pooled. Descriptive summary statistics were explored for all the variables. Univariate associations of the individual outcome variables exam, project and clinical with potential covariates were explored using ANOVA. Univariate associations of the binary outcome variable, residency matching, with potential independent variables were explored using Fisher's exact test. Chi-square association test was used to determine the association between pre-clerkship preference and final clerk site. Multivariate analysis of covariance (MANCOVA) was implemented to explore differences of the three dependent variables exam, project and clinic for the independent variables, using Wilks' Lambda test statistics. Logistic regression was also used for the binary dependent variable residency matching, to examine its association of with independent variables. Data were analyzed using the statistical software SAS (Version 9.1, SAS Institute Inc., Cary, NC, USA). A p -value of 0.05 or less was considered statistically significant.

Results

In total 340 medical students from the graduating classes of 2007 and 2008 were studied. One hundred and seventy-two medical students completed rotations that combined both exposure to an academic health sciences center with a community setting, while 168 medical students had exclusive exposure to a community setting. Students who completed exclusively community based pediatric rotations received slightly higher clinical evaluations (84.51 vs. 83.17, $p < 0.01$), but not exam marks ($p = 0.81$) nor written assignment marks ($p = 0.09$). Clerkship setting had no significant impact on pediatric residency placement ($p = 0.17$). However, for the pediatric residency placement analysis, numbers were small. There were 10 matches from the group exposed to an academic health sciences center vs. 4 matches from the group exposed exclusively to a community setting (see Table 1). Career interest in pediatrics during the second year of medical school positively and significantly impacted clinical performance (84.97 vs. 82.70, $p < 0.001$). Students who expressed a pre-clerkship career interest in pediatrics were more likely to prefer some exposure to an academic health sciences center ($p = 0.05$). Pediatric clerkship rotation site had a small but statistically significant impact on clinical performance (students exposed exclusively to CS scored higher, $p < 0.01$). Rotation site did not demonstrate an impact on examination performance, written assignment marks or match rate to a Canadian pediatric residency program.

Based on the MANCOVA, adjusting for career choice and clerkship site choice, there were no differences on clerkship performance between clerkship site ($p = 0.14$). On the other hand CHOICE of career (interest in pediatrics) even after adjusting for clerkship site preference and final site placement indicates differences on rotation performance ($p < 0.01$). These differences, while statistically significant, were small.

Conclusion

Our findings support previous work showing that students placed in community settings perform as well or better than students exposed exclusively to academic health science centers as assessed by traditional educational outcomes.

Table 1. Pediatric clerkship rotation site impact on examination, written assignment, clinical performance and match rate to a Canadian pediatric residency program.

	Examination (M %)	Written Assignment (M out of 10)	Clinical Performance (M %)	Successful Match to a Canadian Pediatric Residency
6 Weeks Community Setting (n=168)	80.40	8.00	84.51	4
3 Weeks Academic & 3 Weeks Community Setting (n=172)	80.57	7.85	83.12	10
<i>p</i> Value	<i>p</i> = 0.81	<i>p</i> = 0.09	<i>p</i> = 0.01	<i>p</i> = 0.17

Moreover, students who expressed interest in pursuing pediatrics as a career were subsequently found to perform slightly better during their pediatric clerkship regardless of site and were more likely to choose their clerkship site at the AHSC. This could be due to the perception that because the pediatrics residency program is organized from the Hospital for Sick Children, medical students are more likely to encounter faculty members and residents involved with the residency program admissions process. Medical students are more able to liaise with residents and obtain more insight into life as a pediatrics resident. Additionally, students may be more motivated to experience the case load encountered at a tertiary care center.

More importantly, this study did not demonstrate an advantage to an academic exposure for medical students on successful matching to a pediatric residency program in Canada. The non-significant trend favoring an academic setting appears to be offset by pre-rotation site choice and pre-clerkship career preference. In other words, the career preference of the medical student may be a better predictor of subsequent pediatric residency matching success than is the pediatric clerkship type.

The response rate for the “How Medical Students Choose Their Career” survey was incomplete. Although the response rate of first year medical students was 98%, the pre-clerkship response rate for second year medical students was 72%. The latter data were used to control for the potential confounding relationship between career interest, pre-clerkship site preference and pediatric residency matching. It is conceivable that non-responders differed significantly from responders in

terms of initial career interest and proportions choosing different clerkship settings. To our knowledge this is the first study examining the relationship between pediatric clerkship type, career and clerkship site preference and outcomes. The small absolute number of medical students matching to a Canadian pediatric residency limits data interpretation. While non-significant, more than double the number of students from the AHSC group matched to a pediatric residency program. However, when coupled with data showing that students with a career interest in pediatrics were more likely to perform better regardless of site and were also more likely to choose an AHSC clerkship placement, it may well have been the career interest and not the exposure that led to the observed trend in successful pediatric residency matching. Additional studies at other medical schools may generate greater confidence in this conclusion.

This study supports the pedagogical value of community-based pediatric clerkship rotations, showing students from these settings perform as well as or better than students from academic pediatric settings with respect to important educational outcomes. These results help support the decision of curriculum committees to incorporate the use of community clerkship rotations and inform students and faculty as to the validity of distributed medical education within the field of pediatrics.

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