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Psychiatry match rates increase after exposure to a medical student mentorship program: a multisite retrospective cohort analysis

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Abstract

Objective: Since 2002, the Klingenstein Third Generation Foundation (KTGF) has supported a network of medical student mentorship programs (MSMPs) across the United States with the explicit aim of enhancing interest in, and eventual recruitment into the field of child and adolescent psychiatry (CAP). The authors conducted a multisite, retrospective cohort analysis to examine the impact of the program on career selection, as reflected by graduation match rates into psychiatry or pediatrics.

Methods: The authors collected graduating match information (2008 – 2019) from fourteen participating medical schools (Exposed) and thirteen non-participating schools (Control). Control schools were selected based on region, comparable student body and faculty size, national standing, and rank in NIH funding. Match rates into psychiatry and pediatrics were compared between Exposed and Control groups.

Results: Exposed schools had significantly higher match rates into psychiatry as compared to unexposed schools (6.1% and 4.8% respectively; OR [95%CI] = 1.29 [1.18, 1.40]; $X^2 = 32.036$, $p < 0.001$). In contrast, during the same time period, exposed schools had significantly lower match

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Compliance with Ethical Standards / Ethical Considerations

This study was deemed exempt by the Yale Human Research Protection Program's Human Investigations Committee (protocol #2000026782).

rates into pediatrics than unexposed ones (11.6 and 10.5%, respectively; OR [95%CI] = 0.89 (0.83, 0.95); $X^2 = 12.127$, $p < 0.001$). These findings persisted even after adjustment for secular trends in match rates.

Conclusions: Seventeen years after its inception, the KTGF medical student mentorship program network has had a positive impact on match rates into general psychiatry. Future studies will address whether these results translate to trainees' eventual selection of careers in CAP.

Keywords

mentorship; medical students; recruitment; workforce; match rates; psychiatry; pediatrics; child and adolescent psychiatry

Recruitment into psychiatry will remain a challenging priority in the coming decades. Because of steady population growth and the retirement of more than half the current workforce, it is anticipated that the US psychiatric workforce will continue to contract through 2024, leading to a significant shortage of psychiatrists [i]. Even as psychiatry residency slots have increased during the past decade [ii], medical students filling those slots increased only slightly during the same period. For example, data from the National Resident Matching Program (NRMP) showed a change from 5.1% of medical school graduates in 2013 to 5.3% in 2017 [iii]. These modest changes in match rates will not lead to a substantial proportional gain in the future psychiatric workforce.

Difficulties in psychiatric recruitment are magnified when considering subspecialty training. There already is a shortfall in the number of specialists dedicated to addiction, consultation-liaison, child and adolescent, and geriatric psychiatry. This shortage is compounded by the fall in application to fellowship programs [iv], which will further impact the pipeline of practitioners dedicated to the care of vulnerable populations in high need of specialized services.

Against this backdrop, it is imperative to find novel ways of attracting medical students into the field of psychiatry and its subspecialties in order to meet current and future public health demands. Medical schools with an educational climate and culture favorable to psychiatry can impact recruitment positively [v]. Exposure of medical students to meaningful and high-yield clinical, didactic and research activities can enhance interest in the field [vi]. Psychiatry student interest groups (PSIGs) are one way to complement curricular initiatives in an effort to further expose students to the field [vii]. The Psychiatric Student Interest Group Network (psychsign.org) is one such initiative, led by medical students and organized under the auspices of the American Psychiatric Association.

As child and adolescent psychiatrists (CAPs) working in academic medical centers charged with training the next generation of practitioners, we are aware that 37% of programs nationally did not fill their classes in 2017 (ranging from 28 to 39% during the previous decade) [3]. Despite a recognized shortage of CAPs, the number of residents in psychiatry choosing the subspecialty has not changed significantly since 1995 [viii]. According to the American Medical Association, there were approximately 8,000 child and adolescent psychiatrists in the United States in 2013. The US Bureau of Health Professions estimates

the need for more than 12,600 specialists by 2020 in order to meet the growing demand for children's mental health care. On average, slightly more than 300 physicians become board certified in CAP each year. After accounting for retirements, the workforce shortfall by 2020 will total 4,300, or approximately 70% of the conservatively estimated overall need [ix, x].

Despite the insufficient growth in the number of CAPs, there are few initiatives to enhance medical student recruitment into the field. Current exposure to the specialty is inconsistent, institution-dependent, and relies on educational supplements to an already overburdened medical school curriculum [xi]. In an effort to address these challenges, we have been part of a national network seeking to enhance medical student recruitment into CAP through its most common portal of entry – residency training in general psychiatry.

In this report, we present findings from a multisite, retrospective cohort analysis that examined the impact of this network on medical students' career selection, as reflected by graduation match rates into psychiatry or pediatrics. To the best of our knowledge, this is the first large-scale report on the impact of a medical student program on match rates in psychiatry.

Methods:

The Klingenstein Third Generation Foundation (KTGF) has provided funding since 2002 to medical schools across the country to administer a medical student mentorship program (MSMP). Schools with clinical, training and research presence in CAP have been invited to apply through competitive requests for proposals. The purpose of the MSMP is to encourage students to explore the field of CAP through mentorship, early clinical exposure, research, and advocacy throughout medical school. A 2007 study of the program demonstrated that the MSMP improved perceptions and understanding of the field for participants [xii]. More recent data from a KTGF-sponsored national conference showed that perceptions of child psychiatry improved, and perceptions of stigma decreased, among medical students who attended the intensive two-day meeting [xiii].

The National MSMP Network has grown to include by now 14 programs based on AAMC-accredited medical schools around the country. All MSMPs participating in the Network have utilized four main components to various degrees [xiv]: a) direct clinical experience working with children, adolescents and their families; b) a seminar series, with a mode of 6 annual meetings, co-organized by medical students and CAP faculty, adapted to each program's unique needs and interests; c) exposure to, and involvement in ongoing clinical and/or scholarly activities, and d) attendance to an annual conference (the 14th such reunion took place in January 2020).

We matched medical schools with an MSMP (hereafter 'Exposed') to non-participating schools ('Control'), based on region, school size, and research rank according to US News and World Report [xv]. We obtained match rates into pediatrics (including medicine-pediatrics) and psychiatry (including triple board and psychiatry-CAP combined-track programs) for medical school cohorts between 2008 and 2019. We specifically explored match rates into pediatrics given that medical students in the Network are typically

interested in working with children. We obtained these anonymized and pooled data from publicly posted sources: 1) ‘Results and Data, Main Residency Match®’ reports from the National Resident Matching Program® website (nrmp.org) [3]; and 2) School-specific match information from each of the 27 schools’ websites (typically through their respective office of the registrar). We extracted, for each school-year cohort, the number of graduating students, and the number of those matching into psychiatry or pediatrics. Given that the year of MSMP inception varied among participating schools, we established an ‘after implementation period’ starting two years after the school began participating; two years was considered the minimum amount of time for a program to potentially influence the choices of graduating students.

This study was deemed exempt by the Yale Human Research Protection Program’s Human Investigations Committee (protocol #2000026782).

We first used chi square statistics and odds ratios (ORs) to compare match rates into psychiatry or pediatrics between Exposed and Control schools. We then applied binary logistic regression models to explore the independent effects of program exposure, before and after their implementation. We obtained adjusted ORs and 95% confidence intervals (95% CI) using match status (yes/no) as dependent variable, and program exposure (yes/no) and timing of implementation (after/before) as independent variables. We included an exposure-by-implementation interaction and conducted analyses separately for psychiatry and pediatrics. We used SPSS 25.0 (Armonk NY) as our statistical package.

Results:

Data were collected from 14 Exposed and 13 Control medical schools. A median of 11 years of complete data per school were available for analysis (range, 10 – 12). This yielded 68 years of pre-implementation and 218 years of post-implementation data, with information on 39,316 individual students overall. As summarized in Table 1, in unadjusted models Exposed schools had significantly higher match rates into psychiatry than Control schools (6.1 vs 4.8%, OR [95% CI] = 1.29 [1.18, 1.40]; $X^2 = 32.036$, $p < 0.001$). In contrast, Exposed schools during the same time period had lower match rates into pediatrics than Controls (10.5 vs 11.6%; OR [95% CI] = 0.89 (0.83, 0.95); $X^2 = 12.127$, $p < 0.001$).

In an adjusted binary logistic regression model summarized in Table 2, timing of the program was significant, revealing a higher match rate two years after its implementation (OR [95% CI] = 1.43 [1.23, 1.66], $p < 0.001$). This effect was evident regardless of exposure to the program, as reflected by the non-significant exposure-by-timing interaction term. In other words, all schools, whether exposed to the program or not, showed higher match rates in the years following implementation, consistent with a secular trend that was independent of program participation. After controlling for this secular trend, exposure to the program still resulted in significantly higher match rates in psychiatry (OR [95% CI] = 1.86 [1.60, 2.16], $p < 0.001$). By comparison, none of the corresponding adjusted analyses were significant for the match outcomes for pediatrics (data not shown).

Discussion:

These findings suggest that exposure to a MSMP increased match rates into psychiatry, but not pediatrics, in a large sample of graduating medical students spanning over a decade. This effect was specific to schools exposed to the program and persisted after taking into account a secular trend toward higher psychiatry match rates during the later years of the observation period [8]. This decade-long trajectory in career choice may be related to millennials' prioritization of values, to medicine's wellbeing movement, or to the renewed promise of understanding brain mechanisms in the service of clinical care^[xvi, xviii, xvii].

Even as our findings support the salutary role of the MSMP toward recruitment into psychiatry residencies, it is important to acknowledge that there was a difference in psychiatry match rates between Exposed and Control schools that predated program adoption (5.0 vs 3.9%, respectively). This suggests that MSMP-participating schools may already have had a culture of prioritizing exposure to psychiatry, or a greater focus on the field [5]. Beyond that difference, the effect of program exposure was significant even after controlling for the underlying secular increase in psychiatry match rates. Notably, Exposed schools with KTGF programs had lower rates of matching into pediatrics. Although caution should be exercised in interpreting this inverse relationship, we can conclude that the effect of exposure to the MSMP appears to be unique to psychiatry. Continued follow up of this unique cohort will clarify whether the MSMP effect extends into CAP recruitment.

Despite these welcome changes in psychiatry match rates, CAP slots continue to go unfilled [8]. Over the past 30 years, there has been a substantial decrease in interest in this subspecialty training between the fourth year of medical school and the fourth year of psychiatry residency ^[xix]. Underlying extrinsic reasons may include resident burnout, which could make another 1–2 years of training unbearable, or student debt and the requisite delay of repayment and earning potential ^[xx]. Intrinsic reasons specific to the field may also contribute: caring for children and families involves a significant amount of unreimbursed time, and the emotional toll of working with difficult socioeconomic conditions, childhood trauma and familial psychopathology can be taxing. All of these factors may conspire against medical students' perception of CAP as a viable option. Medical students' decisions to opt away from CAP have shown among the top considerations: salary concerns, stigma, lack of respect within medical colleagues, and limited exposure to the field ^[xxi].

The question persists as to how and when best to introduce child psychiatry to students in order to foster their interest during medical school and residency training. CAP exposure early in the medical school curriculum can be decisive [11, 14], as students with previous coursework and clinical opportunities in the field show higher interest in CAP as a career choice ^[xxii]. This is in keeping with our earlier experience with the MSMP [13, 14].

There are limitations inherent to the use of retrospective, pooled data, and our design precluded the ability to establish causality. We were unable to obtain student-level information, which limited our ability to draw conclusions between actual student participation in the program and eventual residency choice. In addition, we acknowledge the compromises inherent to matching schools while balancing size, region, research rank,

and availability of data. Given how the computerized ranking algorithm works, it is possible that some graduates matched into psychiatry if another (preferred) field was not available; although we have no way to quantify these possible outcomes, we consider them to be rare, and unlikely to vary according to MSMP exposure status. Importantly, we were unable to directly study our main outcome of interest: selection of CAP as a subspecialty. The long lag time between medical school matriculation and graduation from CAP fellowship, as well as the small number of students selecting the subspecialty, make it challenging to sufficiently power such a quantitative study at this time.

Despite such limitations, our results suggest that exposure to this specific mentorship program in CAP is associated with a higher likelihood of students pursuing psychiatry careers. This and similar mentorship programs may be an important first step toward addressing the shortage of psychiatrists in general, and of subspecialists in particular. The MSMP provides a unique and replicable model for exposing medical students to the field of CAP, exposure that is not routinely offered during undergraduate medical training [14]. The program itself [12], and its associated annual conference [13] have already been found to improve perceptions of the field among medical students and will allow those entering non-psychiatric specialties to also contribute to the mental health care of children.

Seventeen years after its inception, the KTGF medical school mentorship program network has had a positive impact on match rates into general psychiatry. Future studies will evaluate whether these findings translate into trainees' subsequent selection of careers in CAP. Qualitative studies of exposed and unexposed students selecting into or out of CAP training may also prove a fruitful next step in assessing key factors that may help recruit students to, or deter them from careers in CAP.

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Table 1

Medical students matching into psychiatry or pediatrics, according to exposure to mentorship program and timing of its implementation

Programs	Students (n)				OR (95% CI)	
	Matched	Unmatched	Total	Match rate (%)	Exposure	Timing
	Psychiatry					
Unexposed	1,008	20,021	21,029	4.8	Reference	..
Exposed	1,113	17,174	18,287	6.1	1.29 (1.18, 1.40) ***	..
Before	452	10,156	10,608	4.3	..	Reference
Two years after implementation	1,669	27,039	28,708	5.8	..	1.39 (1.25, 1.54) ***
Total	2,121	37,195	39,316	5.4
Pediatrics						
Unexposed	2,438	18,591	21,029	11.6	Reference	..
Exposed	1,918	16,369	18,287	10.5	0.89 (0.83, 0.95) ***	..
Before	1,224	9,384	10,608	11.5	..	Reference
Two years after implementation	3,132	25,576	28,708	10.9	..	0.94 (0.88, 1.01)
Total	4,356	34,960	39,316	11.1

p<0.001

Table 2

Adjusted binary logistic regression model of students matching into psychiatry, according to exposure to mentorship program and timing of its implementation

Predictor	B	S.E.	Wald (df = 1)	dt	p	Exp(B)
Exposure (1 = yes; 0 = no)	0.621	0.076	66.154	1	<0.001	1.86 (1.60, 2.16)
Timing (1 = two years after implementation; 0 = before)	0.356	0.078	21.01	1	<0.001	1.43 (1.23, 1.66)
Exposed-by-timing interaction	-0.045	0.108	0.170	1	ns	..
Constant	-3.595	0.036

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