Noncompletion in Pediatric Rheumatology Fellowships

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Abstract

Background One challenge facing the health care workforce is a paucity of pediatrics subspecialists. No prior studies have investigated fellowship noncompletion as an influence of the subspecialty workforce.

Objective We sought to determine the noncompletion rate for pediatric rheumatology fellowships and to identify demographic characteristics associated with noncompletion.

Methods A retrospective cohort study of all trainees entering US pediatric rheumatology fellowship programs between 1997 and 2007 was performed. American Board of Pediatrics tracking data were used to determine completion status (completer or noncompleter) for each trainee. Completers were compared with noncompleters, using the independent variables sex, medical school location, and age. The noncompletion rate was calculated overall and individually. Program size was examined as a predictor of nonompletion rate. Data analysis used χ^2 tests, Kruskal-Wallis tests, and Spearman correlation.

Results The cohort included 182 trainees from 28 pediatric rheumatology fellowship programs. Program size ranged from 1 to 18 trainees. The overall noncompletion rate was 16%. Male fellows, especially male international medical graduates, were more likely to be noncompleters. Noncompletion rates varied among programs: 15 programs had noncompletion rates of 0% and 4 programs had noncompletion rates of 50% or higher. Program size was not associated with noncompletion rate.

Conclusions During the study period, 1 of 6 pediatric rheumatology fellows did not complete training. Noncompletion was concentrated in a small number of programs. Further research should investigate noncompletion across specialties, identifying the causes of noncompletion at the individual, program, and specialty levels to inform future interventions to improve fellowship completion.

Introduction

Over the past 10 years, there has been a steady increase in the total number of trainees in pediatrics subspecialty fellowships.[1] As such, there are currently more fellows enrolled in pediatrics subspecialty training programs than at any prior point in history. Despite this marked growth, reports of a shortage of practitioners in several pediatrics subspecialties abound.[2–6] This perceived shortage, or mismatch in the supply of and demand for pediatrics subspecialty services, affects practitioners in multiple fields. Primary care providers may lack access to subspecialty consultation for their patients with pediatric diseases, and nonpediatrics specialists may need to care for pediatrics patients because of a lack of pediatrics providers. The shortage also affects primary care and specialty education, as many training programs do not have the full array of pediatrics specialists on faculty. One factor that may contribute to the overall supply of pediatrics subspecialty practitioners is fellowship noncompletion by trainees.

Previous studies in other specialties have indicated that residency noncompletion occurs at different rates in different specialties and programs; estimates have ranged from 4% in a survey of obstetrics-gynecology residency program directors in 2001[7] to 30% in a single general

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surgery residency from 1986 through 2006.[8] No studies to date have investigated fellowship noncompletion in any subspecialty.

Pediatric rheumatology is an ideal specialty on which to focus when examining the impact of fellowship noncompletion. With approximately 300 board-certified pediatric rheumatologists in the United States,[1] the supply of pediatric rheumatologists is especially sensitive to even small numbers of fellows not completing training. Furthermore, over the past 10 years the subspecialty has focused explicitly on increasing the number of trainees. Several programs, such as the Pediatric Rheumatology Residents Program[9] and the Pediatric Rheumatology Visiting Professorship[10] sponsored by the American College of Rheumatology, have been implemented to increase interest in pediatric rheumatology training among pediatrics residents. Similar to several other subspecialties, pediatric rheumatology fellowship programs have experienced dramatic growth in trainees over the past 10 years; the number of first-year fellows has doubled during that period.[1] Finally, the small total number of rheumatology fellows allows for hand-checking of training completion to ensure accuracy.

The goals of this study were to (1) determine the noncompletion rate for pediatric rheumatology fellowships and (2) identify individual and programmatic characteristics associated with noncompletion.

Methods

We performed a retrospective cohort study of all trainees entering US pediatric rheumatology fellowship programs between 1997 and 2007 using deidentified tracking data obtained from the American Board of Pediatrics (ABP).

For all trainees, tracking data included a unique coded identifier for the individual fellow; a coded identifier for the specific fellowship program in which the fellow was enrolled; the trainee's fellowship start and end dates; the year in which the fellow was approved to take the pediatric rheumatology subspecialty certification examination; and the fellow's sex, medical school location, and month and year of birth. Tracking data were obtained for 1997 through 2010, so that all trainees included in the cohort could complete 3 full years of training. The data for 2008 through 2010 included only trainees continuing and/or completing their fellowships. No data were included for trainees entering fellowship programs during these years.

Fellows were identified as having completed rheumatology fellowship training (completers) if 1 or more of the following criteria were met: (1) their duration of training was $\geq$ 3 years; (2) they were approved to take the pediatric rheumatology subspecialty certification examination; or (3) they were noted to have completed a 2-year special abbreviated fellowship pathway. The files of all trainees identified as noncompleters were hand-checked by ABP staff to confirm the accuracy of that designation. Analyses were then performed to identify trends and additional analyses, including generation of interaction terms, were performed as needed.

The frequency of noncompletion was calculated for pediatric rheumatology fellowships overall as well as for each of the 28 individual fellowship programs. Because of the small sample size and nonnormal distribution, nonparametric tests (χ^2 and Kruskal-Wallis) were used to compare completers with noncompleters. The association of program size with program noncompletion rate was investigated using Spearman correlation.

Our study was granted exemption status by the University of Michigan Institutional Review Board.

Results

The cohort included 182 trainees from 28 pediatric rheumatology fellowship programs. Fellowship programs ranged in size from 1 to 18 trainees enrolled during the study period. There were 29 noncompleters during the study period, for an overall noncompletion rate of 16%.

After initial bivariate analyses indicated that male international medical graduates may have an increased rate of fellowship noncompletion, an interaction term was generated to combine sex of the trainee with medical school type. Male fellows, especially international medical graduates, were in fact more likely to be noncompleters (P = .02 and $P < .01$, respectively). Specifically, 25% of men (16 of 65) and 11% of women (13 of 117) did not complete their fellowships. No significant differences were found in age, year of fellowship entry, or program size for completers versus noncompleters (TABLE).

Noncompletion rates varied widely at the program level; 15 programs had noncompletion rates of 0% over the entire study period, and 4 programs had noncompletion rates of 50% or higher (FIGURE). Two programs accounted for more than 40% of the noncompleters. Program size (ie, number of fellows during the study period) was not associated with program noncompletion rate (P = .70).

Discussion

The most important finding from this study is that 1 of every 6 pediatric rheumatology fellowship trainees who began training to become a pediatric rheumatologist during the study period did not complete the fellowship program. Bivariate analyses showed that male international medical graduates were more likely to be noncompleters. Although knowledge of this association may allow fellowship

TABLE **Bivariate Comparison of Fellowship Completers and Noncompleters**[a]

	Completers (n = 153)	Noncompleters (n = 29)	*P* Value
International medical graduates, No. (%)	40 (26)	12 (41)	.23
Male fellows, No. (%)	49 (32)	16 (55)	.02
Male international medical graduates, No. (%)	11 (7)	8 (28)	< .01
Age in years at fellowship entry, median (IQR)	31.9 (30.4–37.6)	31.5 (29.7–33.3)	.07
Year of fellowship entry, median (IQR)	2004 (2001–2006)	2004 (2001–2006)	.75
Program size, median (IQR)	10 (5–15)	8 (4–12)	.48

Abbreviation: IQR, interquartile range.

[a] Nonparametric tests (χ^2 and Kruskal-Wallis) were used for bivariate comparisons because of the small sample size and nonnormal distribution.

program directors to identify some trainees at high risk for noncompletion early in training, noncompletion occurred across every demographic group assessed. Thus, although focusing on fellows perceived to be at higher risk for fellowship noncompletion may appear to be a more efficient strategy, it may not be the most effective strategy. A previous study of attrition in obstetrics-gynecology residents indicated that demographic characteristics, such as sex, are associated with specific causes of noncompletion.[7] For example, female residents were more likely to leave training for family reasons, whereas male residents were more likely to change specialties. As such, future studies should use a qualitative approach to identify the underlying causes for noncompletion among all noncompleters. In this way the pediatric rheumatology community may be better able to target future interventions toward specific persons to increase the number of practicing pediatric rheumatologists.

Another finding was that pediatric rheumatology fellowship noncompletion was concentrated in a small number of programs. It is impossible to determine the origin of this pattern of distribution without first understanding the reasons trainees leave their fellowship programs, and second, understanding the differences between fellowship programs. A better match of trainees to programs may result in improved completion rates, but only if this match is based in characteristics that matter. In addition, an open discussion about noncompletion in the pediatric rheumatology community may result in a more collaborative approach to fellowship training, as programs could share their experiences and learn from each other.

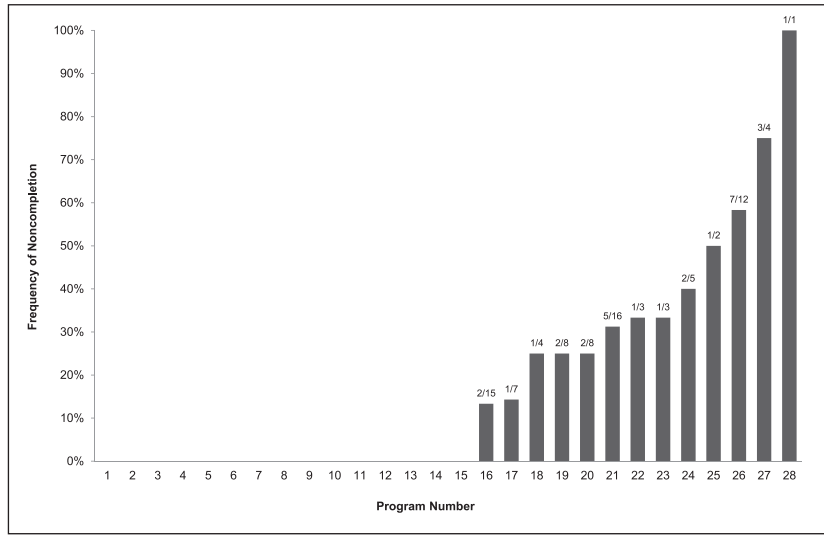

FIGURE **Number of Noncompleters/Total Number of Trainees in the Program During the Study Period**

This study has several limitations. As an analysis of tracking data, we were unable to investigate the root causes for fellowship noncompletion. We had minimal information about the fellowship programs themselves because of the deidentification process and, therefore, could not address the impact of program factors other than size on noncompletion. Our study did not address whether noncompletion was appropriate; 4 of the noncompleters had poor performance records on file with the ABP and would likely have been dismissed from their training programs. The tracking data used for this study did not include trainees entering fellowship during the last 6 training cycles, and it is possible that the trends in fellowship noncompletion have changed over time. Finally, our small sample limited our power to identify true associations of demographic or program factors with noncompletion.

Conclusion

Noncompletion is a common problem in pediatric rheumatology fellowships, affecting 1 of every 6 trainees during the study period. It is concentrated among male international medical graduates and in certain training programs, but it will be critical to elucidate the underlying causes for noncompletion if this trend is to be corrected. Our study has important implications for pediatric rheumatology and other specialties as it indicates that noncompletion should be a target for future interventions to increase the number of practitioners in a given field. Continuing to increase the flow of trainees into specific residencies and fellowships will not result in the desired magnitude of increase of practicing physicians if those trainees do not complete their training.

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