

# Impact of Curricula and Electives on Primary Care Specialty Choice: A Narrative Synthesis

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**BACKGROUND AND OBJECTIVES:** Educational components and electives that may influence medical student choice of primary care careers have been studied individually, but not reviewed or synthesized. Examining educational components and electives in a comprehensive manner may inform evidence-based approaches to raise the number of primary care physicians in the United States and help optimize use of finite resources. We sought to determine evidence-based educational components and electives associated with increased medical student choice of primary care careers.

**METHODS:** We searched PubMed, Scopus, and CINAHL for undergraduate medical education articles in English describing an educational component or elective and outcome relevant to primary care specialty choice. We assessed titles, then abstracts, and finally full texts for inclusion in a narrative synthesis.

**RESULTS:** The searches returned 11,211 articles and we found 42 that met the inclusion criteria. The most described components were outpatient clinical rotations, preclinical courses, and preceptorships. The most common electives were international health, summer preceptorships, and rural medicine. While most articles described curricula that appeared to have a positive correlation with primary care specialty choice, six articles found limited benefit. In sum, results were mixed.

**CONCLUSIONS:** The current literature is limited, and many contemporary electives have not been studied with respect to primary care choice. Increased attention and funding to studying the impact of electives and other educational components on primary care specialty choice is warranted.

(Fam Med. 2022;54(7):572-577.)  
doi: 10.22454/FamMed.2022.638811

Primary care (PC) that is longitudinal, comprehensive, coordinated, and person-centered decreases disparities, improves health system performance, and reduces mortality.<sup>1-3</sup> PC supports the quintuple aim of enhanced patient outcomes, population health, health equity, and clinician well-being at lower costs.<sup>4</sup> Despite these benefits, the United States faces a PC

shortage.<sup>5,6</sup> To address this gap, increased attention to the PC workforce is needed.<sup>7,8</sup> One way to develop the PC workforce is through medical education programs.

Medical school electives are common, positively reviewed, and effectively increase student knowledge.<sup>9</sup> However, the influence of electives on PC specialty choice is uncertain. Additionally, medical education

programs contain components within courses or clerkships that could impact specialty choice. While knowledge, attitudes, and satisfaction have been assessed for some educational components,<sup>10-13</sup> their impact on PC selection is less certain. We explored how electives and other educational components impact student choice of PC specialties.

## Methods

We performed a review and narrative synthesis of relevant literature.<sup>14</sup> Starting with publications identified by a scoping review,<sup>15</sup> we searched MEDLINE (PubMed) and Education Resources Information Center (ERIC) databases for additional original research focused on electives and educational components from inception to April 14, 2020, using search terms developed with a language mapping process.<sup>15</sup> We used keywords and database-specific controlled vocabulary to describe

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concepts of choice behavior, family and PC physicians, medical education, curricula, and electives with subsequent citation chaining in Scopus to ensure comprehensiveness. Inclusion and exclusion criteria are shown in Figure 1 and search terms are shown in Appendix A (<https://journals.stfm.org/media/4917/nguyen-fm-v54appendixa.pdf>).

All articles were independently assessed for inclusion by two authors. When assessments differed, authors discussed to reach consensus. We defined electives as optional educational experiences led by institutions; and educational components as modules, class sessions, or other elements within a course, clinical rotation, or educational program. We categorized studies by theme, study design, institutional characteristics, and effectiveness.

We assessed the quality of included articles using the 16-item quality assessment tool (QATSDD; maximum possible score=48), that was developed to examine studies with varied methodologies.<sup>16</sup> Each article was evaluated by two authors, who discussed scoring discrepancies larger than one standard deviation until consensus was achieved.

Our study was determined to be non-human subjects research by the Michigan State University Institutional Review Board.

## Results

The scoping review identified 33 articles. Our secondary search found 1,784 articles post-deduplication, including nine that met inclusion criteria, for a total of 42 included studies. Most used cross-sectional or cohort designs and were conducted at US public medical schools (Table 1). Less than one-third described funding sources or were multi-institutional, and the specialties included as PC varied. More than half were published in four journals (Table 2). About half described electives and half described other educational components.

Quality scores ranged from 4 to 34 with a mean (SD) score of 18.6 (6.2) and a median score of 19 (Figure 2). Six articles found no benefit<sup>17–22</sup> or a negative impact<sup>23</sup> from the studied intervention; all others described interventions that appeared to have a positive influence on PC specialty choice.

International health and summer preclinical experiences were the most described electives. Outpatient clinical rotations were the most studied educational components. All showed an association between participation and interest in, or selection of, a PC residency. One study found that intention to participate had as much impact on specialty choice as actual participation, suggesting the

experience reflects student interests, but may not influence specialty choice.<sup>21</sup> Another noted the difference in FM specialty choice was not significant between program participants and those who applied, but were not accepted.<sup>24</sup>

Studies examining preclinical exposure to generalist courses or longitudinal FM experiences had mixed results. One article did not find preclinical exposure to FM faculty to be influential<sup>17</sup> while others did.<sup>25,26</sup> Another study reported a longitudinal clinical experience during preclinical years did not increase students' interest in or selection of a PC career,<sup>21</sup> whereas others were successful.<sup>27,28</sup>

Studies conducted prior to the widespread adoption of required FM clerkships found some benefit from ambulatory experiences on PC specialty choice.<sup>29,30</sup> Nonetheless, more recent studies showed no effect.<sup>20,21</sup> Furthermore, a survey of 123 departments found that community medicine experiences in private schools may be associated with lower family medicine match rates.<sup>23</sup>

## Discussion

Most electives and educational components studied were associated with PC specialty choice. While this may reflect a publication bias toward positive findings, seven of 42 did not

**Figure 1: Inclusion and Exclusion Criteria**

<b>Inclusion Criteria</b>
<ul style="list-style-type: none"> <li>• Original intervention or observation focused on medical school electives or educational components with outcomes related to increasing the proportion of students choosing primary care, or proxy outcomes such as interest in primary care, attitudes toward primary care, or intention to match in a primary care specialty.               <ul style="list-style-type: none"> <li>• <i>Electives</i> were defined as optional institution-led curricular activities for which students have faculty or physician supervision, and typically earn academic credit. Electives can take place at any time during medical school enrollment.</li> <li>• <i>Educational components</i> were defined as brief curricular programming, typically part of a larger course, that does not meet criteria for a clerkship or an educational pathway (clerkships and educational pathways are explored in separate articles). These educational components were curricular, not extracurricular, thus, students were supervised by faculty and earned academic credit during these activities.</li> </ul> </li> <li>• Articles were included if they examined student interest, match, or eventual practice in family medicine or primary care. Definitions of primary care varied, as primary care was defined by the authors of each publication.</li> <li>• Study population in Australia, Canada, New Zealand, or the United States</li> <li>• English language publication</li> </ul>
<b>Exclusion Criteria</b>
<ul style="list-style-type: none"> <li>• Articles limited to graduate medical education</li> <li>• Study population in countries not listed in the inclusion criteria</li> <li>• Editorials, commentaries, and review articles</li> </ul>

**Table 1: Characteristics of Included Articles (N=42)**

Study Type	n (%)
Cross-sectional	16 (38.1)
Cohort	13 (31)
Pre/postintervention	8 (19)
Qualitative	4 (9.5)
Mixed methods	2 (4.8)
<b>Academic Setting</b>	
Public schools only	24 (57.1)
Private schools only	7 (16.7)
Mix of public and private	7 (16.7)
Unable to determine	4 (9.5)
Articles that included more than one institution	9 (21.4)
<b>Articles That Reported Funding</b>	
<b>Location</b>	
United States	39 (93.0)
Australia	1 (2.3)
New Zealand	1 (2.3)
<b>Number of Articles by Specialties Defined as PC by Article Authors</b>	
Family medicine	33 (78.6)
Internal medicine	23 (54.8)
Pediatrics	21 (50)
Internal medicine-pediatrics	4 (9.5)
Preventive medicine	1 (2.4)
General surgery	1 (2.4)
Emergency medicine	1 (2.4)
General practice	1 (2.4)
Undefined	6 (14.3)
<b>Year of Publication</b>	
1980-1989	3 (7.1)
1990-1999	15 (35.7)
2000-2009	15 (35.7)
2010-2020	9 (21.4)

Abbreviation: PC, primary care

show a benefit of the studied intervention.

International health and summer preclinical electives were positively associated with FM specialty choice; however, most studies did not control for initial student interest. Few articles examined obstetrics, community

medicine, or domestic service-learning experiences. We found no studies that measured the impact of FM electives in addiction medicine, adolescent medicine, hospice/palliative care, integrative health, geriatrics, public health, sleep medicine, sports medicine, or women's health. Future

studies should assess the impact of such electives on PC specialty choice.

Another area that was not explored in the included articles was the potential influence of working with physician faculty or volunteer preceptors who were burned out or dissatisfied with their work.

Table 2: Publications Included, by Journal

Number of Articles Published	Journal	Article(s)
10	<i>Family Medicine</i>	Beasley 1993 Bissonette and Routé 1994 Crump et al 2010 Godkin and Savageau 2003 Haq et al 2000 Jones 1993 Mengel and Davis 1995 Mengel et al 1992 Pearson and Westra 2016 Ramsey et al 2004
6	<i>Academic Medicine</i>	Lang et al 2005 Nieman et al 2004 Pust and Moher 1992 Seim 1997 Stearns et al 1993 Xu et al 1999
3	<i>Journal of General Internal Medicine</i>	Grayson et al 2001 Kalet et al 1998 Schwartz et al 1995
3	<i>Medical Education Online</i>	Hawthorne and Dinh 2017 Cronau and Haines 2004 Malloy and Stroup-Benham 2001
2	<i>Journal of Medical Education</i>	Blumenthal et al 1983 Brearley et al 1982
2	<i>Southern Medical Journal</i>	Corbett et al 2002 Weiland et al 2019
2	<i>Teaching and Learning in Medicine</i>	Davidson 2002 Wimsatt et al 2016
1 each	<i>Advances in Health Sciences Education: Theory and Practice</i> <i>American Journal of Preventive Medicine</i> <i>Annals of Global Health</i> <i>Australian Family Physician</i> <i>Education for Health: Change in Learning &amp; Practice</i> <i>Education for Primary Care</i> <i>International Journal of Health Services</i> <i>Journal of Health Care for the Poor and Underserved</i> <i>Journal of the American Osteopathic Association</i> <i>Journal of the Kentucky Medical Association</i> <i>Journal of the National Medical Association</i> <i>Journal of Urban Health</i> <i>Medical Education</i>	Dobie et al 1997 Campos-Outcalt 1985 Chang et al 2019 Thistlewaite et al 2008 Urbina et al 2003 Willoughby et al 2016 Brooks 1992 Dever et al 2001 Dogbey et al 2018 Blue et al 1996 Bazargan et al 2006 Bruno et al 2014 Mihalynuk et al 2006
1	Conference proceedings	Mann 1994

Examining the impression of over-worked doctors on learners could be a future consideration.

Many of the interventions described are now common elements of medical education programs. Despite widespread adoption, the PC workforce shortage persists, suggesting the need for further curricular innovation. While some interventions

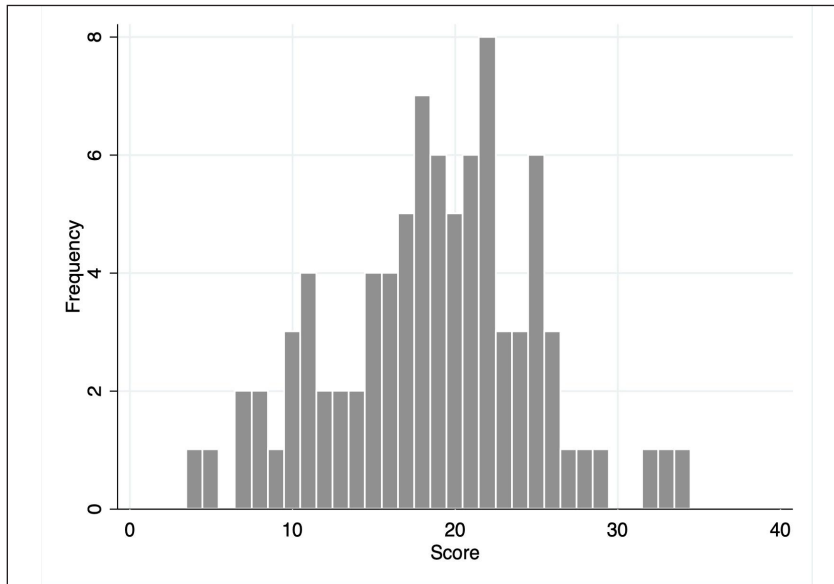
were designed to produce more PC physicians,<sup>21,23,27,28,31–33</sup> others reflected shifts in clinical practice<sup>20</sup> or did not describe intent in their development.<sup>17,30,34,35</sup>

Given most studies were descriptive, cross-sectional, or single institution, results are difficult to generalize and causality cannot be determined. Few studies were funded and most

of those were cross-sectional surveys. Increased support for PC educational research could improve its scope and quality.

This study is limited by the heterogeneity and methodological rigor of the identified articles. Also, 33 of the studies were published before 2010, and their relevance to

Figure 2: Quality Scores Histogram



contemporary medical education is uncertain.

We conclude that some electives and educational components are associated with PC specialty choice. However, the current literature is limited, contemporary electives have not been adequately studied, and none describe clear causation between intervention and specialty choice. Increased attention and funding are needed to develop more robust research in this area. Career choice is a complex issue and electives and educational components are only one contributing factor.

**ACKNOWLEDGMENTS:** The authors thank Deborah Erlich, Esther Guard, Amanda Kost, Christy Ledford, Amy Lee, Morgan Pratte, Mimi Raleigh, Tomoko Sairenji, and Dean Seehusen for developing the list of articles, discussions, and providing feedback.

**FINANCIAL SUPPORT:** This project was partially supported by a grant from the American Board of Family Medicine Foundation (J. Phillips, PI), and partially by the Health Resources and Services Administration (HRSA) of the United States Department of Health and Human Services (HHS) under grant number D54HP23297, "Academic Administrative Units" (C. Morley, PI). This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by AAFP, HRSA, HHS, or the US Government.

**CONFLICT DISCLOSURE:** Author B. Nguyen owns equity in Abbvie, a biopharmaceutical research and development corporation, but it is not in conflict with the topic of this study.

**PRESENTATIONS:** Preliminary findings have been presented at the following conferences:

- NAPCRG Annual Meeting, November 20-24, 2020 (virtual)
- STFM Conference on Medical Student Education, February 1-4, 2021 (virtual)
- STFM Annual Spring Conference, May 3-7, 2021 (virtual)

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