

## Thirty Years of Family Medicine Publications in Israel (1975–2004): What, Where, and How Much?

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**Background:** Departments of family medicine in Israel were established in the 1970s. Until now, little or no effort has been made to characterize the productivity of Israeli board-certified family medicine physicians in publishing peer-reviewed scientific articles.

**Methods:** Publications were identified by 2 methods. First, a PubMed search by names of current and past faculty from all the departments of family medicine in Israel (1975–2004). Secondly, all of the departments in Israel forwarded a list of all publications by their faculty (including those that do not appear in Medline). The abstracts of all publications were extracted and were separately and blindly evaluated by 2 reviewers. Publications were classified according to Medline citation, language, journal impact factor, and publication type.

**Results:** A total of 1165 publications were identified and analyzed. More than half of the articles were published in the last 10 years. Seventy-two percent were cited in Medline. Publications in English encompassed 64.7% of the publications, Hebrew 34.6%, and 0.7% other. Approximately 6% of the articles were published in journals with impact factor  $\geq 3$ , with research articles accounting for 46.9%. The publication output of family medicine in Israel averaged 85.4 publications per 1000 family medicine physicians per year. Almost 70% of the articles were published in non-family medicine journals. Academically affiliated, board-certified family medicine physicians published at higher rates, averaging 334.3 per 1000 academic family medicine physicians per year (data available for 2000–2004 only).

**Conclusions:** Publishing and research are important to the development of family medicine as an academic profession, in which Israeli family physicians show significant productivity. (J Am Board Fam Med 2009;22:57–61.)

Many clinical conditions are seen today almost exclusively in the community setting and there is a lack of knowledge about the management of health problems in this nonhospital (community) setting.<sup>1</sup> Family medicine research should address the need to further the knowledge of family physicians so that they may better manage their patients and fulfill their role in health care.<sup>2</sup>

Family physicians are not as active in research as are specialists among other medical disciplines. A

survey of academic family medicine departments in the United States documented low productivity and significant research barriers. It seemed that the majority of faculty members spent little time on research due to their primary roles in clinical and administrative positions.<sup>3</sup> Although family medicine has a respectable standing in terms of service and education, it has lower productivity in the areas of science and research.<sup>4</sup> However, Pathman et al<sup>5</sup> recently reported a 58% increase from 2000 to

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2003 in research publications by US family medicine authors.

During the last 30 years only one study attempted to determine issues associated with family physicians' involvement in research in Israel; it focused on factors that encourage or deter family medicine physicians and residents from participating in research.<sup>6</sup> The following study was designed to analyze the publication productivity of family medicine authors in Israel during the past 30 years (1975–2004) by type of publication, journal impact factor, and quantity, and to record changes in these measurements over time, providing data that may be useful for international comparison.

## Methods

### Setting

Family medicine developed as a new discipline in Israel in the 1970s.<sup>7</sup> At present, there are 12 departments in the country, each affiliated academically with one of the 4 university medical schools: Hebrew University in Jerusalem, Tel-Aviv University, Ben-Gurion University of the Negev, and The Technion in Haifa.

The number of family medicine specialist physicians in Israel has increased throughout the years, beginning with 140 in 1975 and reaching 1187 in 2004. This increase is partially due to a flux of immigration during the 1990s from the previous Soviet Union. The number of physicians affiliated with an academic institution has been 213 during the years 2000 to 2004. Unfortunately, we have no data for the previous periods.

### Methodology

Publications were identified by 2 methods. First, a search of PubMed by names of current and past faculty from all the departments of family medicine in Israel (1975 to 2004). Secondly, a review of a list of all faculty publications, as provided by each department in Israel (including those that do not appear in Medline), was performed. The abstracts of all publications were then extracted and were separately and blindly evaluated by 2 reviewers (PY and TH). Disagreements were discussed until a consensus was reached.

Publications were classified according to Medline citation, language, journal impact factor in 2004, and publication type. Publications were classified according to the following variables:

- Citation in Medline (yes/no)
- Language (Hebrew/English/other)
- Journal impact factor  $<3$  or  $\geq 3$ . The journal impact factor was determined using 2004 published data. A cutoff point of 3.0 was decided since all of the family medicine journals in 2004 had an impact factor of  $<2.0$ .
- Type of publication. These included (1) case reports/series, in which a patient or several patients were presented with relevant literature review; (2) a review, which was an in-depth, critical analysis of the literature about clinical problems, disease entities, or treatment modalities; or (3) research, which included descriptive and hypothesis-driven studies or evaluation of educational and service programs, in which data was collected using a questionnaire or other methods, whether qualitative or quantitative, and then analyzed.

## Results

A total of 1165 publications (from 1975–2004) were identified and analyzed. Fifty-six percent of the articles were published during 1995 to 2004 (656 of 1165), and 72.1% were cited in Medline. English-language publications encompassed 65.4% of the total, Hebrew accounted for 34.6% and other languages accounted for 0.7%; 5.9% of all articles were published in the higher impact factor journals ( $\geq 3.0$ ). The main type of publication was research articles (46.9%) followed by reviews (37.8%), case reports (12.5%), and others (2.8%). More articles were published in journals with impact factor  $\geq 3$  in the last decade (1995–2004). In addition, the prevalence of research articles, publications in English, and citation in Medline increased compared with the other decades and categories (Table 1).

To evaluate research productivity, we calculated a publication index (the number of publications per 1000 board-certified family medicine physicians), as shown in Table 2. Although there have been fluctuations throughout the years, the average number of publications per 1000 family medicine physicians in each decade (1975–1984, 1985–1994, and 1995–2004) has remained fairly high and stable, with an overall average of 85.4. When only board-certified family medicine physicians with an academic affiliation were considered (data available for 2000–2004 only), output reached an average of 334.3 publications per 1000 family medicine phy-

**Table 1. Publications by Family Medicine Specialist Physicians in Israel, 1975 to 2004**

	Decades			Total (n = 1165)
	1975–1984 (n = 116)	1985–1994 (n = 393)	1995–2004 (n = 656)	
Cited in Medline				
Yes	74 (63.8)	280 (71.2)	486 (74.1)	840 (72.1)
No	42 (36.2)	113 (28.8)	170 (25.9)	325 (27.9)
Publication language				
Hebrew	45 (38.8)	141 (35.9)	217 (33.1)	403 (34.6)
English/other languages	71 (61.2)	252 (64.1)	439 (66.9)	762 (65.4)
Journal impact factor				
>3	7 (6.1)	15 (3.8)	47 (7.2)	69 (5.9)
<3	109 (93.9)	378 (96.2)	609 (92.8)	1096 (94.1)
Type of publication				
Review article	50 (43.1)	126 (32.1)	263 (40.3)	439 (37.8)
Case report/series	13 (11.2)	76 (19.4)	56 (8.6)	145 (12.5)
Research	50 (43.1)	176 (44.9)	319 (48.9)	545 (46.9)
Other	3 (2.6)	14 (3.6)	15 (2.3)	32 (2.8)
Total	116	392 (miss = 1)	653 (miss = 3)	1161 (miss = 4)

All data provide as n (%).

sicians per year as compared with an average of 69.3 publications per 1000 board-certified family medicine physician per year in the same period.

### Discussion

Among all the medical disciplines, family medicine and general practice are known to have lower publication rates.<sup>8</sup> According to Curtis et al,<sup>9</sup> only 12.5% of family physician fellowship graduates responding to a survey published one or more articles per year, compared with 36.5% of their peers (pri-

mary internists and pediatricians). Culpepper and Franks<sup>7</sup> reported that the major obstacles to research reported by US family medicine faculty were lack of faculty time (78%), lack of funding for faculty or staff (61%), equipment and supplies (48%), lack of research skills (45%), and role models (43%).

Medical students who choose a residency in family medicine may be less interested in research than those who select other specialties. They are also less likely to participate in research projects during medical

**Table 2. Number of Publications Per 1000 Board-Certified Family Medicine Physicians Per Decade Compared With 1000 Board-Certified Academically Affiliated Family Medicine Physicians, in Israel**

Time Period	Publications Per 1000 Board-Certified FM Physicians (average n)	Publications Per 1000 Board-Certified FM Physicians Per Year (n)	Publications Per 1000 Academically Affiliated FM Physicians Per Year (n)
1975–1984	75		
1985–1994	105		
1995–2004	76.1		
Total Average	85.4		
2000		89.6	384
2001		89.7	413.1
2002		69.5	347.4
2003		60.7	319.2
2004		37.1	206.6
Total Average		69.3	334.3

FM, family medicine.

school, and after graduation they are less likely to plan on a career that involves research.<sup>10</sup> Thomas et al<sup>11</sup> reported that, during a 5-year period, only 6% of the publications in 3 UK primary care journals were randomized control trials.<sup>11</sup> This may reflect the greater emphasis on translating research into practice in the primary care setting.

The average number of publications per family medicine physicians in Israel has remained fairly stable during the 3 decades examined, with an annual average of 85.4 publications per 1000 board-certified family medicine physicians. This is probably because, in the 1990s, there was a significant increase in the number of family physicians in Israel after a large influx from the former Soviet Union. Most family physicians are currently involved primarily in providing health care services and fewer are affiliated with academic departments.

Our findings from Israel clearly show significant higher publication productivity compared with those published in Australia, where the publication output was only 1 per 1000 general practitioners in practice per year (over the period 1990–1999).<sup>12</sup> It is unclear if the definition of general practitioners in Australia includes only general practitioners or board-certified family medicine physicians or both, or if it also includes any other physician working in the community (such as internists or pediatricians).

When we only considered board-certified family medicine physicians with an academic affiliation (most of who were part time, with data available for 2000–2004 only), their output reached an impressive average of 334.3 publications per 1000 academic family medicine physicians per year. The publication productivity per year of internists in Australia was reported to be 105 of 1000, and only 61 of 1000 surgeons. However, during the 5-year study period (2000–2004) a significant decrease in rate of publication was noted. This is probably because of the increase in workload and the fact that even family medicine physicians with academic affiliations are heavily involved in service and none hold a full academic position.

We found that more than half of the articles in our study were published in the last decade and almost 70% of the articles written by Israeli family physicians are published in non-family medicine journals. A cross-sectional analysis of family medicine publications from the United States comparing the years 1979 and 1989 found that one half of the articles were published in family medicine jour-

nals and that this percentage did not change between the compared periods.<sup>13</sup> Possible reasons for submitting manuscripts to non-family medicine journals maybe the perception that the non-family medicine journals have wider readership and prestige than do family medicine journals, and that institutional promotion and tenure committees may be giving less weight to publications in family medicine journals.<sup>14,15</sup> It is also possible that some family medicine researchers are engaged in research more suitable for public health, epidemiology, or other specialty journals.

Family physicians are responsible for 1.6% of the total number of medical publications in Israel.<sup>16</sup> According to 1999 data,<sup>17</sup> Israel had a higher national publication output (publications per million inhabitants) compared with other countries such as Sweden, Switzerland, Denmark, the United Kingdom, and the United States both during the periods of 1986 to 1990 and 1991 to 1995.

The main limitation of this study is the lack of previous data on family physicians' academic affiliations; only data from 2000 to 2004 were available. Knowledge of productivity in relation to academic position could provide further insight into the real factors influencing publications and research in family medicine.

This study summarizes 30 years of scientific publication activity in Israel and thus provides an important tool for the evaluation of research and publications productivity in family medicine. To develop as a profession and compete with other clinical disciplines it will be important to demonstrate increasing productivity in research and publications. This is further strengthened by Pathman et al,<sup>5</sup> who reported on research publications in 2003 by US family medicine authors. Publishing grew substantially from 2000 by 58%, the number of authors publishing increased by 41%, and journals used increased by 82%. Our evaluation similarly depicts that Israeli family physicians have a significant high publication rate, which should serve as a motivational tool and provide impetus in their further development as an academic profession.

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