

Factors Associated with Research Interest and Activity During Family Practice Residency

Jonathan L. Temte, MD, MS; Paul H. Hunter, MD; John W. Beasley, MD

Background: Family medicine lacks a tradition of research training during residency. Previous studies of research during residency have surveyed faculty to assess residents' research interests. In contrast, we directly assessed research interest and activity during residency by surveying all 203 Wisconsin family practice residents. **Methods:** The survey instrument was a questionnaire that included questions about the appropriateness of research experience, interest in pursuing research during residency, involvement in research, and perceptions regarding program research support. The importance of factors that encourage research were evaluated. We then used stepwise discriminant analysis to assess whether residents with different levels of interest in research had different perceptions about program support and environmental factors that promote research. **Results:** Of 143 respondents, most (85%) felt research experience was desirable, and 48% were interested in pursuing research during residency. Only 8% were active in research. Although faculty were perceived as having sufficient research skills and encouraging resident research, few residents responded that dedicated time, seminars on goals and methods of family practice research, or funding were available. Residents with research interests were more likely to respond that their faculty had sufficient research skills and knowledge. Active researchers rated time availability and access to resource personnel as highly important. Those interested, but not active, rated basic information, assistance in identifying topics, and a forum for presentation as highly important. **Conclusion:** Exposure to skilled and knowledgeable faculty researchers may stimulate interest in research. Teaching research goals and methods, assisting in identifying topics, and providing research forums, especially early in residency, may promote research activity. Dedicated time for research and availability of resource personnel will enhance this activity.

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Scholarly research activity is emerging as an important facet of family medicine,¹ and it has long been argued that active research is necessary for the continued growth and development of a scientific discipline.² The emergence of family practice research has been hampered, however, by the lack of a strong research tradition and the broad base of this specialty.³

The lack of a focused research mission in family medicine has a variety of manifestations. At the entry level, primary care specialties attract medical students with significantly less research interest than do other specialties.⁴ For example, of 141 MD/PhD graduates from Washington University entering medical residencies over a 21-year period, not one chose family practice as a career specialty.⁵ It is not surprising,

therefore, that only 0.2% of graduates of US family practice residencies surveyed in 1991 were primarily entering research careers.⁶ An important question remains, however, regarding when family physicians should receive research training.

Research training during residency can provide a structured environment where research activity is encouraged and valued,⁷ and necessary resources are likely to be available. A survey of family practice residency directors⁸ indicated that 64.4% of the programs had policies that encouraged research by residents, and 14.9% required research. This contrasts with the national trend in which 68.2% of subspecialty residency programs require research projects by their residents, and 37.6% of all residency programs that accept PGY-1 residents require residents to complete research projects.⁹

Several obstacles may exist to the incorporation of research into residency training programs. These in-

From the Department of Family Medicine and Practice, University of Wisconsin, Madison (Drs Temte and Beasley); and Eau Claire Family Practice Residency, Eau Claire, Wis. (Dr Hunter).

clude the lack of resident interest in research, inexperienced and overextended faculty, insufficient funding, and the lack of time for research.⁸ (Personal communication: M. Jacques, March 18, 1992). These barriers, however, have been identified by residency directors. In this study, we directly examined research interest and activity of family practice residents. Resident perceptions regarding residency program research support were assessed. The level of importance assigned by residents to environmental factors and the extent to which program support may influence research interest and activity was correlated to residents' research interests.

Methods

Questionnaire

A cross-sectional, self-report design was used to assess features of research interest and activity among family practice residents. The sample population was comprised of all residents training at the 11 Wisconsin residency programs during 1991-1992. The residencies include five programs administered by the University of Wisconsin, five affiliated with the Medical College of Wisconsin, and one affiliated with the Mayo Clinic.

In this study, a questionnaire was distributed to all Wisconsin family practice residents ($n=203$) using the Wisconsin Research Network (WReN)¹⁰ liaison at each residency program. The residency programs, however, did not have any formal ties to the WReN system nor were residents involved in any required research experience. The liaisons were responsible for distribution, collection, and return of the completed questionnaires.

The one-page questionnaire collected basic demographic information about respondents' postgraduate year (PGY) and sex. The first three questions were designed to ascertain the level of research interest and current research activity of residents. A series of six yes/no questions defined the perceived level of residency support for resident research activity. The importance of five factors that serve to encourage or enable research was assessed using a five-point scale for each factor. The selection of factors resulted from discussions within a small group of residents interested in pursuing research and were modified from those previously shown to enable research by faculty.¹¹ These factors were: background information on the goals and methods of family practice research, assistance in identifying a research topic, designated time for research activities, personnel to assist with project design and data analysis, and a forum for presentation of results.

Statistical Analysis

Demographic data, levels of research activity and interest, and program support features were expressed

Table 1

Demographic characteristics of responding family practice residents

	Number of Responses	Percentage
Postgraduate Year		
1	43	30.7
2	52	37.1
3	45	32.1
Sex		
Female	50	35.5
Male	91	64.5
Type of Program		
University administered	68	47.6
University affiliated	75	52.4

as simple percentages. The residents were divided into four hierarchical index groups based on the questions about research interest and activity as follows: Group I.—Residents who did not feel research experience is desirable for family physicians. Group II.—Residents who felt research experience is desirable, but had no interest in pursuing research during residency. Group III.—Residents who were interested in pursuing a research project during residency, but were not currently active. Group IV.—Residents who were currently active in a research project. Differing levels in the importance of five encouraging factors among index groups were then assessed using analysis of variance (ANOVA).¹²

Further analyses were directed at 1) identifying which demographic and program support features may explain differences between residents who were interested in pursuing research from those who were not interested (not-interested groups I-II vs. interested groups III-IV), and 2) which enabling factors may identify differences between residents who were active in research and those who were interested in pursuing research, but who were not active (non-active group III vs. active group IV). Stepwise discriminant analysis was used to differentiate between the two interest level groups based on characteristics of program support and demographic data. This multivariate analysis tested whether differences existed among groups by incorporating into the discriminant function only those variables which were significantly different among the groups.¹³ The group means derived from the discriminant function were compared using ANOVA. As a consequence, this analysis not only identified differences between groups, but also identified those variables that produced these differences.

A second analysis was performed to assess differences among activity groups using the levels of importance attached to encouraging factors. Groups I and II were excluded from this analysis because these resi-

dents were not interested in pursuing research during residency. Again, stepwise discriminant analysis was used to identify significant discriminating variables and ANOVA was used to compare group means.

Results

Demographics

A response rate of 70.4% (143/203) was obtained following two distributions of the questionnaire. Because no significant differences were found among the two distributions in terms of research interests and activity of residents ($X^2=2.12$; d.f.=2; N.S.) the data from both distributions were pooled.

The demographic characteristics of respondents are provided in Table 1. The PGY distribution was equally divided among the three years of residency ($X^2=1.003$; N.S.). Approximately two-thirds of the respondents were male. The sex ratio of respondents was no different than that of all Wisconsin family practice residents ($X^2=0.194$; N.S.). The responses were nearly equally divided between university-administered and university-affiliated programs.

Research Interest and Activity

Of the residents responding, 85.3% felt that research experience was desirable for family physicians and 47.6% were interested in pursuing research during residency. Only 11 residents (7.7%), however, were actively involved in research projects.

Program Support for Research

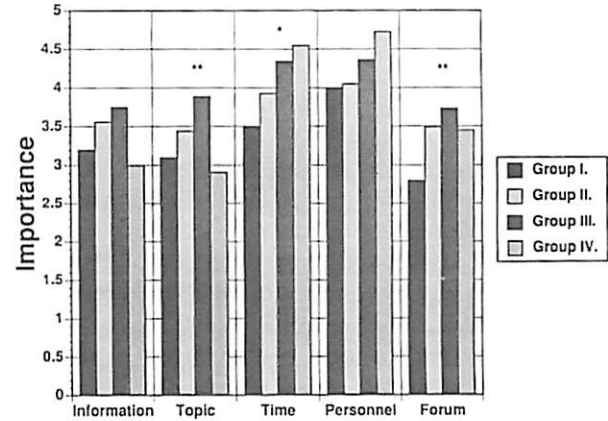
The perceptions of family practice residents about their program's research support varied widely. Most felt that their faculty had sufficient research skills and knowledge (79.7%) and that their faculty encouraged research (75.5%). Less than half responded that their programs provided time for research (40.6%) and one out of four (23.8%) identified seminar time devoted to discussion of goals and methods of family practice research. Only 11.1% of residents knew that funding was available for research at their program. One resident (0.7%) thought that research was required at his program.

Encouraging/Enabling Factors

The five factors were evaluated regarding their importance in encouraging or enabling research during residency and each was rated as moderately to highly important on a five-point scale (range: 3.53-4.22). When separated by index group and assessed by ANOVA, significant differences among groups were found in the levels of importance assigned to topic, time, and forum. Residents who were interested but not active in research rated topic and forum as more highly important than did other groups; active residents rated time as more highly important than did other groups (Figure 1).

Figure 1

Importance of five environmental factors based on level of research interest and activity



Significant differences among index groups are indicated as: * $P<0.05$; ** $P<0.01$. Importance on 5-point scale with 0=not important for encouraging or enabling research during residency; 5=highly important. Groups defined in text. Number of residents per group as follows: I. = 21; II. = 54; III. = 57; IV. = 11.

Differences Among Index Groups

Residents who were interested in pursuing research during residency (Groups III-IV; $n=66$) were compared to those not interested (Groups I-II; $n=74$), based on demographic data and perceptions on program support. Stepwise discriminant analysis identified three significant variables that differentiated the two groups. Residents who were interested in research were more likely to be of lower PGY-class and female. In addition, these residents were more likely to identify faculty in their programs who have sufficient research skills and research knowledge. No other feature of program support was identified as significant. The group means of the discriminant function were significantly different (ANOVA: $F[1138]=16.06$; $P<0.0001$).

Resident researchers (Group IV; $n=11$) were compared to residents interested, but not actively engaged, in research (Group III; $n=56$) based on their evaluation of factors which encourage and enable research activity. All five environmental factors were identified as significant variables by stepwise discriminant analysis and were, in order of entry into the analysis, topic, personnel, information, time, and forum. Residents who were active in research were more likely to identify needs for designated time and support personnel as important to research activity. Those not active, but

interested in pursuing research, were more likely to rate background information, assistance in identifying research topics, and a forum for research presentations as more highly important. The group means of the discriminant function were significantly different (ANOVA; $f[1,65]=17.74$; $P<0.0001$).

Discussion

Any discussion on the incorporation of research training into residency programs should consider the interests and needs of family practice residents. Our results, although limited to Wisconsin family practice residents, complement those based on the views of residency faculty. The most remarkable finding of our survey was the high level of interest in research that family practice residents displayed. Most residents felt that research experience was desirable for family physicians. This holds true, with a 60.1% rate of agreement, even if the results are corrected using a "worst case" scenario¹⁴ which assumes that all non-respondents felt otherwise. In addition, approximately one-half of the Wisconsin residents responded that they would be interested in pursuing research during their residency. These findings conflict, to some extent, with surveys of program directors (Personal communication: M. Jacques, March, 1992) which identified lack of interest among residents as a common barrier to resident research. Hence, additional research needs to address the generalizability of our results.

Our discriminant analysis, in assessing differences among residents interested in research from those who were not, identified skilled and knowledgeable faculty as the only significant program support variable. Likewise, Bland and Schmitz¹⁵ emphasized the importance of advisors and mentors in the training of future researchers. This has been found in other medical specialties as well. For example, a study of radiologists identified personal contact with talented, accomplished faculty researchers as the most significant influence related to choosing research careers and being successful in publishing research.¹⁶

Specific factors are necessary for research to exist and flourish within residency programs. An attitude of "research emphasis" must exist, coupled with adequate resources. Bland and Ruffin¹¹ identify necessary resources as "those the individual perceives as necessary to carry out a research program." These may include human resources, time, funding, facilities, and library access. Whereas Wisconsin residencies are perceived by residents to have faculty resources in terms of skills, knowledge, and encouragement, the programs may not be providing residents with sufficient background information, and significant uninterrupted time and funding. As a result, only 16.2% of interested residents are actively involved in research.

All five environmental factors were rated as moderately to highly important for encouraging or enabling

research during residency. However, different needs occurred at different times in the research process. Residents who were interested in research, but not as yet active, indicated that background information, assistance in the identification of a research topic, and having a forum for research presentation were more important than did other residents. There are numerous resources that provide succinct background information on family practice research^{3,17-19} and which could easily be incorporated into a core research curriculum.¹ Research topic identification is facilitated by an experienced researcher who can realistically evaluate the feasibility of a project. Communication of research methods and results is an important aspect of research culture.^{15,20} Several annual scientific meetings exist that are very appropriate for family practice resident researchers. For example, the Annual Meeting of the Wisconsin Research Network (WReN) now provides a forum for resident research. On a nationwide basis, the American Academy of Family Physicians includes presentation of resident research at several of its national meetings.

Resident researchers, like their faculty counterparts¹¹, identified the importance of time and resource personnel to assist with research design and data analysis. Whereas time during residency is limited, research electives are often available. There is need, however, for a combination of block and longitudinal time dedicated to research. The availability of residency personnel with familiarity of research design, library accession skills, and knowledge of statistics is essential for a successful research project. In some programs, a single person can provide this assistance.

Obligatory research participation did not increase the future research interests of medical student participants.²¹ Nevertheless, attention to cultivating the existing high level of research interest of family practice residents may increase the number of clinician-investigators in our field. Several needs have been identified for successful resident research based on this survey of family practice residents. As our results have suggested that lower PGY-class is associated with greater research interest, we feel it is essential to start research training early in residency.

Assignment of interested residents to faculty mentors, and establishing seminar time devoted to research goals and methods should also occur early in residency training. In addition, association with other resident researchers both within and outside the residency can provide necessary communication with and stimulation by peers. Availability of time for research and access to resource personnel becomes crucial once a project is undertaken. Policies that promote dedicated time and access to support personnel by residents are strongly supported.

Research activity within family medicine continues to evolve. This movement to develop our own set of

research questions and knowledge base is dependent not only on the current cohort of researchers, but on those residents now in training and those medical students yet to choose family practice as a career. Encouragement of research as a valued part of family practice needs to occur at the entry level of our specialty. We hope that further discussion will be stimulated as a result of this study.

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Corresponding Author: Address correspondence to Dr Temte, Department of Family Medicine and Practice, University of Wisconsin, 777 South Mills Street, Madison, WI 53715.

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