Evaluation of the program of introduction to research in pediatric residency at Hospital General de Niños Pedro de Elizalde, 1997-2012

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ABSTRACT

Introduction. There is little information regarding research during internship and residency. Our objective is to describe interns' and residents' scientific research output, to estimate the rate of dissemination of their work (presentation in a scientific meeting and/or publication), and to identify potential barriers to dissemination.

Methods. Cross-sectional study that included all articles developed at the Resident Research Training Program of Hospital General de Niños Pedro de Elizalde (HGNPE) between 1997 and 2012.

Results. Authors of 451/531 articles were contacted. The annual output underwent a steady increase (1997= 12 vs. 2012= 40; R2= 0.88; $p < 0.001$).When exclusively considering research projects (no reviews) (n= 195), 30.8% were disseminated (26.7% were presented in meetings and 11.3% were published). Retrospective studies were more frequently disseminated than prospective ones (37.5% vs. 21.7%; OR: 2.17; $p < 0.02$), and this also occurs with analytical projects when compared to descriptive ones (41.2% vs. 16%; OR: 3,67; $p < 0.001$). Lack of time was the most common reason for not disseminating research findings (45.9%).

Conclusion. Only 30.8% of research projects were disseminated. Studies with retrospective data collection and analytical design had more chances of being disseminated.

Key words*: internship and residency, publications, research projects, research report.*

INTRODUCTION

Research is a fundamental part of medical practice, and should therefore receive equal attention as any other topic during post-graduate education; however, this is far from reality. In 1996, only 27% of residency programs in the United States included research activities.[1]

Additionally, although no research activity may be considered completed until its results are reported and subjected to peer-review, only a limited number of projects get published.[2,3] It is possible that this reality is more evident in those research activities developed during the residency.

There are different strategies to approach research training in the immediate post-graduate period.[4]

For the past 18 years, Hospital General de Niños Pedro de Elizalde (HGNPE) has adopted a comprehensive mentoring program.[5] Although the hospital's scientific output has increased since its implementation,[6] no assessment has been made regarding research specifically resulting from the program.

The objective of this article is to describe residents' scientific output at a children's hospital, to estimate the rate of dissemination of their work (presentation in a scientific meeting and/or publication), and to identify potential barriers to dissemination.

METHODS

Design: Cross-sectional.

Population: All scientific articles developed at the Resident Research Training Program of HGNPE between 1997 and 2012.

Study procedures: Program projects and authors were identified based on the Teaching and Research Committee (CODEI) records. One of the authors of the project was contacted (e-mail, telephone or in person) and asked to complete a closed and self-administered survey regarding the status of their research (completed, ongoing, put off), the dissemination of the results (presented in a meeting and/or published) and

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Conflict of interest: For the past 10 years, the pharmaceutical company Laboratorios Roemmers awarded a research grant to the authors of the best research article written as part of the program to have it submitted to the Latin American Society for Pediatric Research (*Sociedad Latinoamericana de Investigación Pediátrica*, SLAIP) but was not involved in the winner selection process.

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the reasons for not disseminating it, if applicable.

Research was considered having been presented in a meeting if results were announced at a local, national or international (outside the institution) scientific meeting, and published if included in a periodic scientific journal with an international standard serial number (ISSN).

Based on CODEI's records, the following information was collected:

- Residency: Author's specialty.
- Type of project: Research or review, and retrospective or prospective data collection for research.
- Design: Leaving reviews aside, research (with retrospective or prospective data collection) was classified as descriptive or analytical.

Statistical analysis: Categorical outcome measures were expressed as percentages with 95% confidence intervals (CI). The association between dissemination (presentation/publication) and type of research, design and year of development was assessed using a chi-square test. These variables were included in a logistic regression model. Significance level: $p < 0.05$. The SPSS 11.5 (SPSS Inc) software was used.

Ethical considerations: Approval was obtained from the hospital's Research Ethics Committee and Teaching and Research Committee. The study was registered at the Research Project Registry of the City of Buenos Aires (99/13).

RESULTS

Five hundred and thirty-one projects were identified as developed in the program between 1997 and 2012, and the authors of 451 of these were contacted. All projects had been completed. Of these, 81.1% were the work of pediatric residents, and 56.8% corresponded to reviews (*Table 1*).

Annual output significantly increased since the program started (1997= 12 vs. 2012= 40; R2= 0.88; $p < 0.001$) (*Figure 1*).

When exclusively considering research projects (no reviews) (n = 195), 30.8% were disseminated (26.7% were presented in meetings and 11.3% were published). The proportion of disseminated research projects underwent a significant increase in the second part of the period analyzed (2005-2012= 36.6% vs. 1997-2004= 18.03%; OR= 2.6; 95% CI: 1.2-5.5; $p= 0.01$).

Research projects that included retrospective data collection had more chances of getting disseminated than prospective ones (37.5% vs. 21.7%; OR= 2.17; 95% CI: 1.13-4.14; $p < 0.02$). Analytical projects also had more possibilities of being disseminated than descriptive ones (41.2% vs. 16%; OR= 3.67; 95% CI: 1.8-7.4; $p < 0.001$).

After checking the time in the program when research was conducted (first or second half of the study period), retrospective data collection and analytical design were maintained as independent predictors of dissemination (*Table 2*).

The results of 135 projects were never disseminated. Lack of time (45.9%) was reported as the most common reason for failure to reach dissemination, followed by lack of interest (13.3%), lack of incentive (13.2%), and other causes (27.6%).

DISCUSSION

Several strategies have been designed to increase scientific activity during residency, including the development of a research project among all residents,[7] specific training in research,[8] and granting awards to the best scientific production.[9] With the support and commitment of institutions, these measures have usually been successful, but sustaining them over time is essential to achieve a "cultural change."[9]

TABLE 1. *Distribution of projects by type and design*

Type		Projects (n = 451)	%
Literature review		256	56.8
Observational	Descriptive	80	17.7
	Cross-sectional	84	18.6
	Case-control	4	0.9
	Cohort	9	2.0
Experimental	Non-pharmacological experimental	11	2.4
	Basic research	1	0.2
	Phase 3 clinical trial	1	0.2
	Phase 4 clinical trial	5	

The inclusion of research in the syllabus of our pediatric residency and the solid support provided by our institution are certainly accountable for the increase of scientific production at our hospital. The program has continuously been maintained during the past 15 years, and it seems that the desired "cultural change" has already been achieved, or is in the process of being accomplished. On one hand, all research projects related to the program have been completed. On the other hand, scientific production during residency, which was almost null before implementing the program, has undergone a significant increase even though the number of residents has almost always been the same. Moreover, it has possibly influenced the increase in the hospital scientific production in the past years.[10]

This is not surprising since there is evidence of programs similar to ours that have helped to significantly increase scientific production among residents.[11]

A separate assessment should be made in relation to the rate of dissemination of research developed in the program. The need of having research findings disseminated among peers, the only ones responsible for validating them, is an on-going concern. We have found that 30.8% of research projects were disseminated (presentation/publication); specifically, the rate of publication reached 11.3%. This is well below the 36% reported by Holmes for a similar program targeted at emergency medicine residents.[12] However, such difference is similar to that between the rate of publication of abstracts presented in conferences in the Northern Hemisphere (44.5%)[3] and that of abstracts presented in pediatric conferences in Argentina (11.4%).[13] In our setting, it is very likely that scientific publication, the desired goal of any research, is not as prestigious or important for professional development.

However, it is worth noting that once a reward is associated to the program's efforts, better results may be attained.[9]

Although it is beyond the scope of our study,

FIGURE 1. *Research projects by type and year*

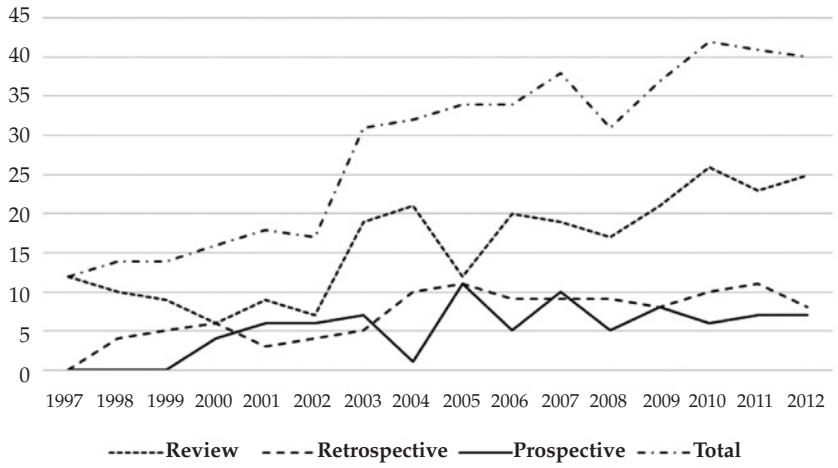

TABLE 2. *Multivariate analysis, including possible predictors of project dissemination (presentation/publication)*

	OR	95% CI		p
Year conducted (>2004)	2.179	0.987	4.809	0.054
Design (analytical)	3.705	1.767	7.766	0.001
Type (retrospective)	2.781	1.387	5.574	0.004

Hosmer-Lemeshow test, p= 0.378.

OR: odds ratio. 95% CI: 95% confidence interval.

it should be noted that every year our program selects the best research work and awards its authors a grant to present it at the annual meeting of the Latin American Society for Pediatric Research. In the 16-year study period, 13 studies have been awarded a grant, and 9 of these were fully published (69%).

When analyzing the possible cause for failure to disseminate results, it is not surprising that analytical studies are more commonly disseminated than descriptive ones; however, it may draw our attention that this also occurs with retrospective projects when compared to prospective ones. It is quite likely that this occurs because retrospective data are more easily accessed to, resulting in more solid manuscripts and, therefore, a higher chance of dissemination.

Lack of time was indicated as the most common reason (45.9%) for not disseminating findings, which is higher that the usually referred rate (33%).[14] Probably work load and dedication required by the residency program also restrict the time available for this activity.

Our study has potential limitations. On one hand, presentation in a meeting/publication was reported by authors; however, data were checked in publications and conference proceedings. Although not all authors were contacted, the rate of response was high (85%), and this allows us to infer that bias is not significant. On the other hand, the study was conducted in 2014 and included projects completed up to 2012. Although there is evidence that most projects are published within two years of completion,[15] we may have underestimated the rate of publication, especially when considering that it was higher in the latest years of the study period.

CONCLUSION

Only 30.8% of research projects conducted by residents were disseminated; those with retrospective data collection and analytical designs had more chances of being disseminated. Lack of time was the most common reason for failure to reach dissemination.

The increased scientific production by residents and the dissemination of their work support the development of the program. ■

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