

## Brief communication (Original)

# Publication of pediatric residency research theses from Prince of Songkla University, Hat Yai, Thailand

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**Background:** The Royal College of Pediatricians of Thailand requires that all its residents complete a full thesis before their final Thai Pediatric Board Examination. The Department of Pediatrics of the Faculty of Medicine, Prince of Songkla University (PSU) has been certified for pediatric residency training since 1985.

**Objectives:** To determine the number of articles published in medical journals that are based on the theses of residents during 25 years of pediatric resident training, and how long after finishing their residency training the articles were published.

**Methods:** Medical journal databases were searched for the names of former pediatric residents. The faculty staff who had supervised them during their training were asked to confirm whether the residents had published their work.

**Results:** During the 25 years (1988–2012), we found records of 34 articles based on the theses of 130 residents published in a medical journal (26%). In the early phase (1988–2002), 15 articles from 67 theses (22%) were published: 10 (67%) in Thai or regional English language journals, and 5 (33%) in international peer-reviewed journals. In the second phase (2003–2012), 19 articles from 63 theses (30%) were published: 6 (32%) in regional English language journals, and 13 (68%) in peer-reviewed international journals.

**Conclusions:** The publication rate of PSU pediatric residency research theses during the 25 years was 26%. We recommend that our faculty devote more time to ensuring supervision of the thesis writing component of the residency training to increase the publication rate of research theses by our residents.

**Keywords:** Pediatric, residency, research

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The academic achievement domains for pediatric residency training include medical knowledge, laboratory skills, clinical service, technical/manual skills, continuing education and research, attitudes, and ethical issues, all of which can be accomplished through patient care, ward work, on-call duty, and attending various academic conferences (including admission conferences, case conferences, topic reviews, evidence-based conferences, morbidity and mortality conferences) [1, 2]. Obtaining experience in research and scholarly pursuits on the path to becoming leaders is expected from our residents and particularly from those who are aiming for an academic career [3-5]. In many countries, writing a thesis [6, 7] or presentation of a thesis [8] is required as part of the medical curriculum [8].

Since 1981, The Royal College of Pediatricians of Thailand (RCPT) has required that before the final Thai Pediatric Board Examination, each resident must complete an acceptable scholarly activity, defined as original research, one or more comprehensive case reports or a satisfactory topical review [2]. The Department of Pediatrics, Prince of Songkla University (PSU) has been certified for pediatric residency training since 1985, with from 4 to 6 residents each year during 1985–2002 and from 6 to 10 residents/year since then. In the early phase (1985–2002) of residency training at PSU, residents conducted their thesis research under supervision by 1 faculty mentor who was a content expert. Since 2002, the Postgraduate Unit of the Department has required that each resident has to conduct their research under supervision by 2 faculty mentors (1 mentor as a research content expert and 1 as a statistical analysis expert), and a time schedule to guide the steps leading to thesis completion (**Table 1**).

**Table 1.** Time schedule for thesis completion during PSU pediatric residency training

	Year 1	Year 2	Year 3
<b>First 6 months</b>	<ul style="list-style-type: none"> <li>• Receive a list of faculty member and their projects</li> <li>• Attend a course of research development</li> </ul>	<ul style="list-style-type: none"> <li>• Data collection</li> <li>• Update presentation on thesis progression</li> </ul>	<ul style="list-style-type: none"> <li>• Data analysis</li> <li>• Oral presentation at the Annual PSU Faculty Conference</li> </ul>
<b>Last 6 months</b>	<ul style="list-style-type: none"> <li>• Develop thesis proposal and send for Institutional Review Board approval</li> <li>• Data analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Data collection</li> <li>• Update presentation on thesis progression</li> </ul>	<ul style="list-style-type: none"> <li>• Submission to the RCPT for Thai Pediatric Board Examination</li> </ul>

PSU = Prince of Songkla University, RCPT = The Royal College of Pediatricians of Thailand

From 1985 to 2012, 130 residents completed PSU pediatric residency training with 130 theses were completed. The aim of this study was to determine the percentage of these theses that were later the basis of an article published in a medical journal and how long after the residents finished their training program these articles appeared in print.

## Methods

The theses completed during residency training at the Department of Pediatrics, PSU, between 1988 (the first year of the program's completion), and 2012 were reviewed retrospectively. The study was divided into 2 time periods: the early phase (15 years) 1988–2002 with 67 theses completed by residents, and the second period covering 2003–2012 with 63 theses completed by residents. Almost all of the residents (128 of 130, 99%) worked with their supervisor on a project conceived by the supervisor. Only 2 of the residents (1%) conducted a research project based on their own design, but under the supervision of a faculty member.

PubMed, Scopus, Web of Science, and Thai journal databases were searched for the names of our pediatric resident graduates and the faculty mentors who had supervised their thesis work. The faculty supervisors were asked to confirm whether the residents had published their work and when after finishing their residency training and when this publishing occurred.

For the purposes of this study, medical journals were classified into 3 categories: Thai journals (journals published in the Thai language), regional English language journals (journals in the Southeast Asia Region published in English), and international English language journals (English language medical journals listed in a medical database such as PubMed, Scopus, or Web of Science).

## Results

Of the 130 theses completed by residents, the most common type of study design was retrospective ( $n = 65$ , 50%), followed by cross-sectional ( $n = 27$ , 21%), prospective ( $n = 18$ , 14%), randomized-controlled trial ( $n = 17$ , 13%), and cohort study ( $n = 3$ , 2%). Of these, 34 (26%) were later published as an article in a journal: 8 (24%) in Thai medical journals, 8 (24%) in regional English language journals, and 18 (53%) in international journals. Divided into the 2 time periods, in the early phase (1988–2002), 15 articles (22%) based on a total 67 theses were published: 8 (53%) in Thai journals (retrospective 4, prospective 4), 2 (13%) in regional English language journals (retrospective 1, prospective 1), and 5 (33%) in international journals (retrospective 2, cross-sectional 1, prospective 1, cohort study 1). During the second phase 2003–2012, 63 theses were completed, of which 19 (30%) were published: 6 (32%) in regional English language journals (retrospective 1, cross-sectional 3, prospective 1, cohort study 1), and 13 (68%) in international journals (retrospective 7, cross-sectional 5, randomized-controlled trial 1, cohort 1). The details of the theses completed by residents and the published articles in the 2 time periods are shown in **Table 2**. There was no correlation between the published articles and the type of research study. The numbers of published articles in each category of journal are shown in **Table 3**.

The median times from when the residents finished their training program to the time their articles were published were 16 months (range 3–52 months) for Thai journals, 20.5 months (range 6–25 months) for regional English language journals, and 21 months (range 9–36 months) for international journals, and was not statistically significantly different between the three types of journals.

**Table 2.** Types of study design of residents' theses and published articles based on residents' theses according to the time period

Type of study design	Early phase (1988-2002)		Second phase (2003-2012)	
	Theses (N)	Published (n)	Theses (N)	Published (n)
Retrospective	39	7 (4 T, 1 R, 2 I)	26	7 (1 R, 6 I)
Cross-sectional	12	1 (1 I)	15	8 (3 R, 5 I)
Prospective	8	6 (4 T, 1 R, 1 I)	10	1 (1 R)
RCT	7	-	10	1 (1 I)
Cohort	1	1 (1 I)	2	2 (1 R, 1 I)
<b>Total</b>	<b>67</b>	<b>15 (8 T, 2 R, 5 I)</b>	<b>63</b>	<b>19 (6 R, 13 I)</b>

RCT = Randomized control trial, T = Thai journals, R = Regional English journals, I = International journals

**Table 3.** The numbers of published articles in each category of journals according to the time period

Time period	Thai journals	Regional journals	International journals
1998–2002 (n = 15)	Songkla Medical Journal (6) Thai Journal of Pediatrics (2)	Journal of Medical Association of Thailand (1) Asia-Pacific Journal of Allergy and Immunology (1)	Journal of Pediatric Endocrinology and Metabolism (3) Journal of Pediatric Gastroenterology and Nutrition (1) Pediatric Nephrology (1)
2003–2012 (n = 19)	(0)	Journal of Medical Association of Thailand (3) Southeast Asian Journal of Tropical Medicine and Public Health (3)	Journal of Pediatric Endocrinology and Metabolism (4) International Journal of Artificial Organs (1) European Journal of Pediatrics (1) Nephrology (1) Archives of Disease in Childhood (1) Cleft Palate and Craniofacial Journal (1) CyberPsychology & Behavior (1) Pediatric Infectious Disease Journal (1) World Journal of Pediatrics (1) PLOS Neglected Tropical Disease (1)

## Discussion

Although 130 theses were completed by our residents during the training period, only 26% of these were later published as an article in a medical journal, which was below our expectation of 35%–40%. Other studies have found varying results [7-9]. The low publication rate of theses by our residents is similar to the findings in other studies that found only 17%–24% of theses completed during medical training were published in indexed Medline journals [7, 8], while, on the other hand, a study in the United Kingdom of research presenters in the Paediatric Research Society and the British Paediatric Association found a high rate of 60% publication in the Medline journals and about 5% in non-indexed journals within 2 years

of presentation [9]. In our study, despite the lower-than-expected numbers, there has been an increase over time in the percentages of publications from the early years of residency training (22%) to the later years (30%). Moreover, there has been an increase in the proportion of articles published in international journals (from 33% to 68%) during the same period. Given the increased attention devoted to supervising the residents beginning in 2002, it is reasonable to suppose that this increased attention has resulted in the increased number of articles being deemed worthy of publication, and has also increased the percentage of publications in the more prestigious international journals.

The main reason why a majority of Thai pediatric residents participate in the thesis project is to fulfill the mandatory scholarly activity required for completion of the residency training program. However, only a few residents are actually interested in performing research because of natural curiosity or for career development. because of time constraints and lack of interest in serious research in this 3-year training program, most of the study designs of the projects studied were retrospective or cross-sectional analyses such as chart reviews and questionnaire surveys as shown [5, 10]. However, prospective studies or randomized controlled trials can be completed within the time constraints if the studies are kept simple, with a small sample size, and designed to allow for the limited amount of resident's time that can be devoted to research.

It is known that undertaking long-term research projects requires higher-than-average motivation, and also good study and research skills [5, 10-12]. The skills required include knowledge of research development, statistical analysis, medical writing skills and, not the least, good time management skills for the project to be completed in time. Each new resident, particularly during the first year, is a beginner with limited experience in every task he or she must perform. This includes demanding patient care and ward work as a house officer, and being prepared for the frequent departmental patient assessment conferences. Developing skills in research work usually comes last. Hence, mentor leadership, encouragement and supervision is an important supporting factor when a research project is planned. Guidelines are needed at every step from the initial planning and proposal preparation, through getting funding support, establishing the research methodology, data collection, statistical analysis, presentation at an academic conference, and finally manuscript preparation for submission to a journal. Although the medical content in a resident's thesis can be adequately provided by a clinician mentor, ensuring the statistical content meets professional journal requirements can be done better by a mentor who is a statistical expert [13]. Recognizing the importance of methodology and statistical analysis to the ultimate success of a resident's research work lead the Postgraduate Unit of our Department to require 2 faculty mentors for each resident's research project: one a content advisor and the other a

methodology/statistical expert. The characteristics of a good faculty mentor for supervising resident research have been described in the literature, and include generosity in availability, being compassionate, enthusiastic, insightful, collaborative, intellectual, and a skilled clinician [14-16].

Manuscript preparation is the final part of the thesis work. Ideally, a report based on each thesis should be published as an article in a medical journal. However, in our residency program, during the study period, only 26% of residents' theses were published. This below-expectation percentage of published articles, can be explained by many reasons as mentioned earlier but, mainly, by lack of experience and time constraints. The median timing from when the residents finished training to the time of publication ranged from 16–21 months, which was similar to the study in the United Kingdom noted earlier, in which most of the residency research based publications were published in a Medline journal within 2–3 years of their thesis presentation [9]. In our study, we found that each published article had the content expertise mentor listed as first author and the resident as the second. This could be explained in that residents completed their theses, and presented their work at the annual faculty conference, 6–9 months before the end of their final training year. At this point, they did not intend to prepare a manuscript themselves, as they had many other pressing concerns including preparation for the rigid written board examination.

In summary, after 25 years of pediatric residency training at the PSU Faculty of Medicine, Department of Pediatrics, training which included the writing of a research-based thesis, overall 26% of the theses completed by residents have been published in a medical journal. It is notable that since 2003, after a time schedule was set to help the residents complete their theses within a defined time frame, the percentage of published articles based on the theses completed by residents increased from 23% to 30% and most of the thesis-based articles have changed from publications in Thai medical journals to international peer-reviewed journals. We conclude that active participation in clinical science research exposes residents to scientific methodology during their pediatric training. Pediatric residents should be encouraged to aim for an article based on their thesis to be published in a medical journal.

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