Effect of Scholarship for Nurses Training on Retention in Their Hometown: Results from Thai Nurse Cohort Study

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ABSTRACT

Background: To alleviating nursing shortage in rural areas, Thailand has implemented scholarships consisting tuition fee and allowance where graduates are required to work in designated areas which is usually their home town. To date, little is known about the effectiveness of scholarship programs in the nursing maldistribution. The objectives of this study were to estimate rate of emigration of registered nurses (RNs) from their hometowns after posting and to determine effects of the scholarship program on emigration.

Methods: This study used 2009 base line data of the Thai Nurse Cohort, a nationally representative sample of 18,756 RNs. The primary outcome is emigration rate of nurses who received a scholarship. The rate of emigration assumed a Poisson distribution. The nominator is the nurses who left their hometowns after posting while the denominator is the total person years of nurse posted in their hometowns. Effect of the scholarship programs was quantified by using multiple cox regression.

Results: Of 18,756 RNs, 8354 who had never been posted in their hometowns were excluded. Of the remaining 10,077 RNs, 97.6% were female, with a mean age of 44.3±9.4 years. Of these, 8188 RNs received the scholarships during their training. The overall rate of emigration from their hometowns after posting was 1.0 per 100 person-years (95%CI: 0.97 to 1.06). RNs who received or not received the scholarships had an equal chance to emigrate (hazard ratio = 1.00; 95%CI: 0.86 to 1.14, p = 0.880). RNs who had taken post-graduate study leave were 68% less likely to emigrate than those who had not (hazard ratio = 0.32; 95%CI: 0.28 to 0.36, p < 0.001).

Conclusions: Once nurses started their career at their hometown, they are unlikely to emigrate irrespective of receiving scholarship. The low emigration rate of one out of a hundred person-year indicates that scholarship program has a positive impact on retention of nurses in their hometowns. Provision of post graduate study leave opportunities may further improve nursing retention.

Keywords: Nurse turnover, Retention, Migration, Scholarship, Health service maldistribution.

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Background

Stable and fully engaged nursing staff to provide effective patient care is essential for any healthcare organizations (Hunt, 2009; Lang, Hodge, Olson, Romano, & Kravitz, 2004). Nursing turnover could lead to nursing maldistributions and shortages due to quitting or switching their jobs or migrating to other areas. A high turnover rate increases work demands from the remaining nurses, hence, the risk of turnover of the remaining nurses (Anderson, Corazzini, & McDaniel, 2004). That is a "vicious cycle" that constantly increases nurse turnover, leading to a high costs and a poor quality of health care (Hunt, 2009; Lang et al., 2004).

Financial incentives programs were widely implemented for improving rate of recruitment and retention. A review involving articles published up to February 2009 concluded that financial-incentive programs have placed substantial numbers of health workers in underserved areas remain in the areas in the long run (Barnighausen & Bloom, 2009). However, the findings had limitation on generalizability. Nonetheless, sponsoring nursing students through scholarships and providing educational re-imbursement has been widely used to promote better recruitment and retention nurses in the designated area (Hunt, 2009; Thaker, Pathman, Mark, & Ricketts, 2008).

In Thailand, most nursing students have been provided financial supports from several of public and private scholarship programs for the costs of nurses' training in exchange for service commitments to work in their hometowns. These programs have been continuously implemented since 1969 aiming for retaining the nurse workforce in their hometowns. Over the past several decades, however, there was no study investigating if these programs are effective in terms of retaining the graduates to remain working at the areas designated by the contracted scholarships. This paper aimed to estimate rate of emigration of RNs from their hometowns and to determine effects of the scholarship program on the emigration.

Methods

This study utilized data from Thai Nurse Cohort Study (TNCS) database. The TNCS was designed as a 20-year longitudinal cohort study. The TNCS aiming to investigate workforce dynamics and health conditions of Thai registered nurses (RN). The initial cohort included RNs who hold professional licenses granted by Thailand Nursing and Midwifery Council (TNC) as of 2008 selected using age-stratified random sampling technique from 5 year-interval age-groups, from 20 to 64. The first wave, which was the baseline survey, was conducted in September 2009 using mailed questionnaire. The baseline survey involved a total of 18,756 respondents who were then members of the Cohort.

The primary outcome of this study was emigration which was defined as nurses who leaved their first workplace area which also implied their hometowns. The factor of interest was, during nurse training, having received a scholarship as a grant support for the costs of the training in exchange for service commitments to work in an area designated by the grant. Extraneous factors being controlled for their effects included age at emigration, years of work experiences, institute from which being graduated, workplace as a place they were born, and work position at started the career.

Demographic and other baseline characteristics of the cohort members were described using mean, standard deviation, median, minimum, and maximum for continuous data and percentage for categorical data. Rate of emigration per 100 person-year since exited nursing career and its 95% confidence interval (CI) were calculated based on Poisson distribution assumption. Cumulative rate by time after employment were presented using Kaplan-Meier methods. Probability sampling weight was used to account for the sampling design of the study.

Regarding investigation of effects of the scholarship program, nurses who didn't employed were excluded from the analysis. For this purpose, hazard ratio (HR) and its 95% CI was estimated using multiple cox regression. This analysis was adjusted for the extraneous variables that were considered biologically and sociologically relevant or that showing a univariate relationship with outcome. Interaction between emigration and workplace as a place they were born was investigated.

All analyses were performed using STATA version 13.0 (StataCorp., College Station, TX). P-value less than 0.05 were considered as statistically significant. This project was approved by the Human Research and Ethics Committees of the Ministry of Public health of Thailand.

Results

Of 18,756 RNs, there were 8354 RNs being excluded due to that they started to work outside their hometowns (Figure 1). A total of 10,077 RNs were included in the study. Of these, 81.3% had received the scholarship for the expenditures of nurses' training in a return of service commitments after graduation to work in their hometowns.

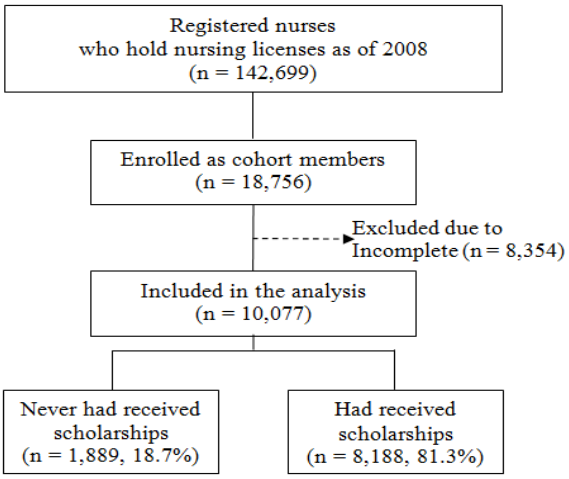

Figure 1 Algorithm of the study.

Among the 10,077 RNs who responded to the scholarship question, there were 8188 receiving the scholarships during their nurses training and 1889 did not (Figure 1). Overall, 97.6% were female, with a mean age of 44.3 ± 9.4 years old. Characteristics at baseline of RNs who had received the scholarship were comparable to those who had not.

Table 1 Demographic characteristic

Characteristics	Total	
	Number	Percent
Sex		
Male	242	2.4
Female	9,789	97.6
Total	10,031	100
Age (years)		
Lower than 25	353	3.5
25 – 44	4,620	45.8
45 or greater	5,104	50.7
Total	10,077	100
Mean (Standard deviation)		44.3 (9.4)
Median (Min : Max)	45.1	(20.6:65.4)

Table 1 Demographic characteristics (cont.)

Characteristics	Total	
	Number	Percent
Marital status		
Single	2,999	29.8
Married	6,233	62.0
Widowed	309	3.1
Divorced	443	4.4
Separated	73	0.7
Total	10,057	100
Region of current workplace		
North	1,234	12.9
Northeast	2,178	22.7
Central	3,543	37.0
East	751	7.8
West	618	6.5
South	1,253	13.1
Total	9,577	100
Highest educational attainment		
Certificate	2,690	27.3
Bachelor degree	5,239	53.2
Master degree	1,732	17.6
Doctoral degree	78	0.8
Others	109	1.1
Total	9,848	100

The overall rate of emigration from their hometowns was 1.0 per 100 person-years (95%CI: 0.97 to 1.06). The corresponding rate was similar for RNs who had received and not received the scholarships (Figure 2). RNs who worked at the private organizations emigrated more than those who worked at government sectors, with a rate of 1.69 and 0.98 per 100 person-years, respectively. RNs who graduated from nursing colleges under Ministry of Public Health of Thailand had a lowest rate of emigration 0.97 per 100 per year.

The rate of emigration increases gradually during the first 10 years after entering nursing career (Figure 3). Comparing between RNs who had received and never had received the scholarships, the corresponding rate was similar as the two survival curves were almost identical (p = 0.864) (Figure 4).

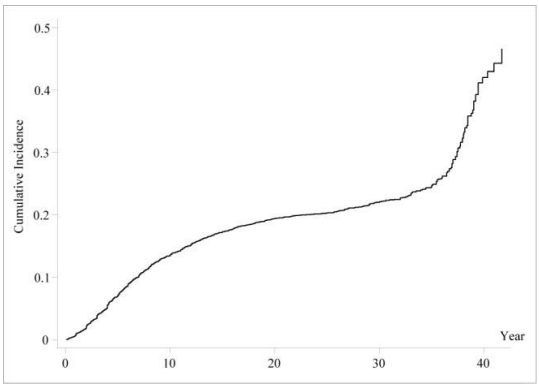

Figure 3 Cumulative incidence of emigration.

Subgroup	Number	Person-years	Rate per 100 person per year	95%CI
Overall	10,077	194,651.3	1.01	0.97, 1.06
Contracted scholarship				
Yes	8,186	160,859.9	1.01	0.96, 1.06
No	1,888	33,791.4	1.01	0.90, 1.12
Type of workplace				
Government	9,469	183,766.5	0.98	0.94, 1.03
Private	480	8,147.5	1.69	1.43, 2.00
Institute from which graduated				
Public university	423	8,753.8	1.13	0.93, 1.38
Nursing colleges under Ministry of Public Health	7,407	141,273.9	0.97	0.92, 1.02
Other nursing colleges	586	13,083.6	1.16	0.99, 1.36
Private institutes	210	3,453.0	1.68	1.30, 2.17
Employment upon started working				
Public health worker	328	5,933.8	1.06	0.83, 1.36
Assistant nurse	638	18,421.1	0.58	0.48, 0.70
Technical nurse	2,407	43,522.1	0.92	0.83, 1.01
Registered nurse	6,203	115,828.9	1.08	1.02, 1.14
Nurse lecturer	97	1,737.4	1.44	0.97, 2.13
Other	347	8,023.7	1.25	1.02, 1.52
Had study opportunity				
Yes	2,509	138,859.7	0.69	0.62, 0.76
No	7,565	55,791.5	1.14	1.09, 1.18

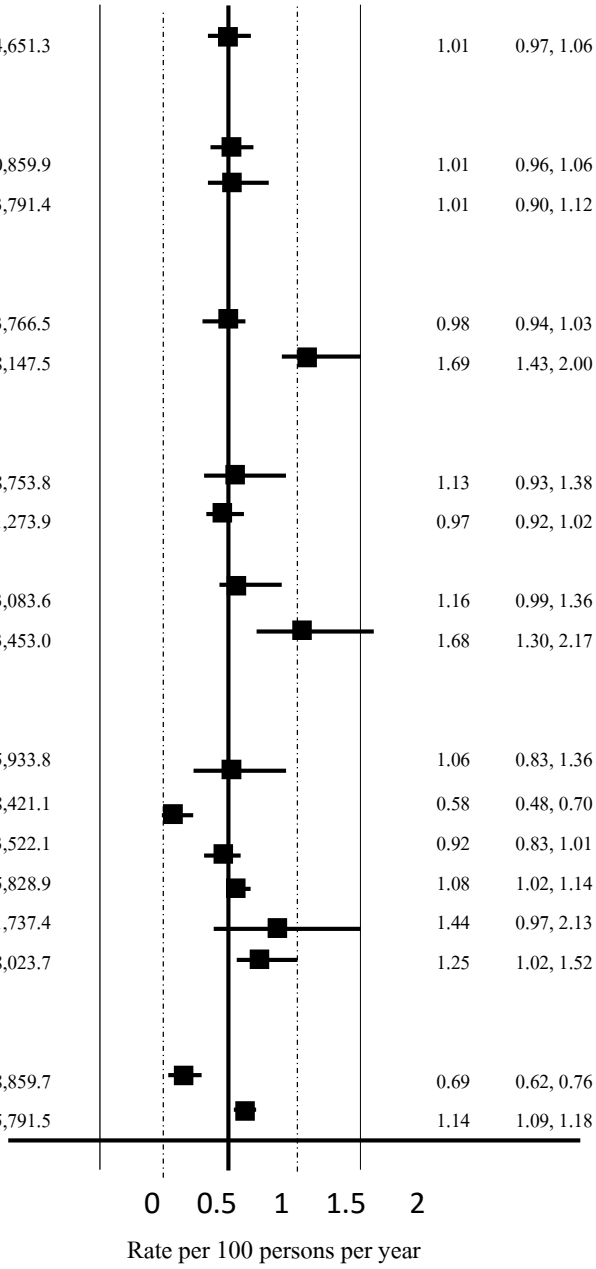

Figure 2 Rate (per 100 per year) of emigration according to relevant subgroup.

Table 2 Multivariable analysis for effects of scholarship programs on emigration from the workplace being designated.

Subgroup	Number	Person-years	Rate/100	Crude HR	Adjusted HR	95%CI	P-value
Having been under contracted scholarship							0.880
Yes	8,186	160,859.9	1.01	1	1		
No	1,888	33,791.4	1.01	1.01	1.00	0.86, 1.14	
Age at emigration	10,077	194,139.5	1.01	0.78	0.76	0.75, 0.77	< 0.001
Institute from which graduated							< 0.001
Public university	423	8,753.8	1.13	1	1		
Nursing colleges under Ministry of	7,407	141,273.9	0.97	0.82	0.75	0.6, 0.93	
Other Public nursing colleges	586	13,083.6	1.16	1.04	1.08	0.84, 1.40	
Private institutes	210	3,453.0	1.68	1.39	1.30	0.91, 1.86	
Employment upon started working							< 0.001
Undergraduate level							
Public health worker	328	5,933.8	1.06	1	1		
Assistant nurse	638	18,421.1	0.58	0.68	0.71	0.50, 0.99	
Technical nurse	2,407	43,522.1	0.92	0.88	0.76	0.57, 1.02	
Graduate level							
Registered nurse	6,203	115,828.9	1.08	1.11	1.18	0.90, 1.56	
Nurse lecturer	97	1,737.4	1.44	1.45	2.22	1.33, 3.72	
Others	347	8,023.7	1.25	1.33	1.46	1.04, 2.06	
Had study leave opportunity							< 0.001
No	2,509	138,859.7	0.69	1	1		
Yes	7,565	55,791.5	1.14	0.61	0.32	0.28, 0.36	

Table 3 Proportion of having study leave opportunity according to scholarship program

Subgroup	Number	Never had study leave opportunity	Ever had study leave opportunity
Received scholarship	8188	6001 (73.3%)	2187 (26.7%)
Not received scholarship	1889	1564 (82.8%)	325 (17.2%)

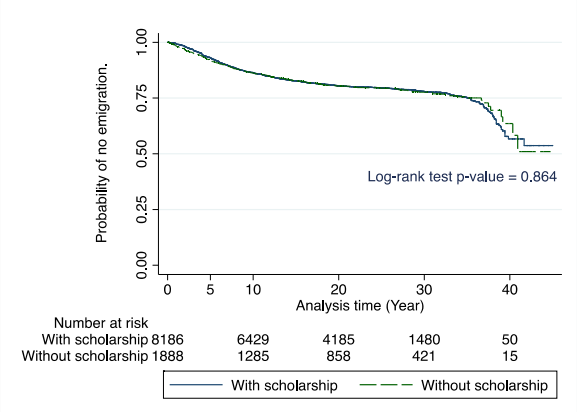

Figure 4 Kaplan-Meier survival estimates of emigration according to registered nurses who had received and never had received the scholarships.

There was a slightly greater proportion of RNs who had study leave opportunity among those who received the scholarship than those who did not, i.e., 26.7% versus 17.2% (Table 3). However, RNs who never had study leave opportunity had a higher rate of emigration than those who had such opportunity, irrespective of whether or not they received the scholarship, i.e., respectively, 1.20 vs 0.70, and 1.10 vs 0.70 per 100 person-years (Table 4).

Table 4 Rate of emigration according to having study leave opportunity for each subgroup of receiving

Subgroup	Number	Emigrated	Person-year	Rate/100
Received scholarship				
Never had study leave opportunity	6001	1295 (21.6%)	112,590.09	1.15
Ever had study leave opportunity	2187	333 (15.2%)	48,269.77	0.69
Total	8188	1628 (19.9%)		
Not Received scholarship				
Never had study leave opportunity	1564	289 (18.5%)	26,269.63	1.10
Ever had study leave opportunity	325	51 (15.7%)	7521.76	0.68
Total	1712	305 (17.8%)		

Discussion

Scholarships for the expenditures of nurses' training in a return of service commitments after graduation to work in the designated areas has been done in Thailand since 1969 and remains implemented nowadays and the designated areas are indeed their hometowns. In this study, 81.3% of RNs who started their nursing career in their hometown. We found that RNs who received or not received the scholarships had an equal chance to emigrate. In addition, the overall rate of the emigration was basically small. This might be explained by both the commitment according to the scholarships and their attitude to work in rural areas being formed during the training, as well as their bonding with the hometown. A qualitative study in Australia supported this. That is, previous connection with a rural area and positive experiences in a rural health care facility during undergraduate preparation were significant factors influencing the graduate nurses' decision to pursue a rural graduate nurse position (Lea & Cruickshank, 2005). Similarly, another quantitative study also demonstrated that students who have previously lived and/or worked in a rural area are more likely to choose a rural setting for clinical placements or postgraduate employment. This study supported that family, financial and employment commitments should be considered in the development of recruitment and retention strategies for health professionals to rural areas (Smith, Edwards, Courtney, & Finlayson, 2001).

Factors that cause nursing turnover are complex. Results from a number of reviews suggested that, after the initial job expectation are met, nurses tended to turnover if they found themselves i) overworked; ii) lack of role clarity; iii) low control over job performance; iv) lack of career opportunities; v) lack of trust and collaboration with coworkers; vi) not receiving recognition / not feeling respect for contributions; vii) poor communication with management around critical issues (Buykx, Humphreys, Wakerman, & Pashen, 2010; Hunt, 2009). In Asia such as the Philippines, higher salaries, better benefits and good career opportunities were identified as most effective incentives for both recruitment and retention (Perrin, Hagopian, Sales, & Huang, 2007).

Based on these known factors, in-country turnover might be more associated with the career opportunity than the other factors, in particular, recruitment and retention of nurses in rural or underserved areas. Nurses tended to choose an urban post rather than a rural one, while salary increase, health center-type of facility and scholarship for specialization could increase a rural job uptake (Huicho et al., 2012). Availability of medical equipment and supplies were also found to be the factors most likely to bring about a move to a rural village (Hanson & Jack, 2010). A study evaluated the relative effectiveness of different policies in attracting nurses to rural areas in Kenya, South Africa and Thailand, involving over 300 graduating nursing students in each country revealed that better educational opportunities or rural allowances would be most effective in increasing the uptake of rural posts in Kenya and South Africa. In Thailand, however, better health insurance coverage would have the greatest impact (Blaauw et al., 2010).

Since all participants of the present study are RNs who started their nursing careers in their hometowns, we can then conclude that once nurses started their career at their hometowns, they are

unlikely to emigrate irrespective of receiving scholarship. In addition, with the present of the scholarship programs, the commitments to remain in their hometowns were enforced, hence, retaining nurses. This made us view this as a positive effect of the scholarship program on retaining nurses working in their hometowns.

In addition, we identified another independent predictor of the emigration that had a significant effect on emigration- the study leave opportunity. That is, RNs who had taken post-graduate study leave were 69% less likely to emigrate than those who had not. This magnitude if effect had already been adjusted for effects of the scholarship programs.

Findings of the current study were drawn from a nationally representative sample of registered nurses in Thailand. The TNCS is the largest and the first nurse cohort study in Southeast Asia region. All information was based on self-administered questionnaire. We considered these are reliable because the respondents are highly educated and the key information regarding receiving the scholarship and emigration are obviously objectives. However, we did not collect the data regarding the reasons of the emigrations.

Conclusions

Once nurses started their career at their hometown, they are unlikely to emigrate irrespective of receiving the scholarship for the expenditures of nurses' training in a return of service commitments after graduation to work in their hometowns. The low emigration rate, one out of a hundred person-year, indicates that scholarship program has a positive impact on retention of nurses in their hometowns. Provision of post graduate study leave opportunities may further improve nursing retention.

Competing interests

The authors declare that they have no competing interests. This material is based upon the TNCs which was financially supported by the Human Resource for Health Research and Development Office, Health System Research Institute, the International Health Planning and Policy, and the Thailand Nursing and Midwifery Council.

Authors' contributions

PP and BT initiated the idea, wrote the original manuscript. KS, TT, VT, KT, and NC provided constructive criticism and edits of the drafts of the manuscripts. BT wrote the analysis plan and wrote the first draft of the manuscript with the support of KS and VT. PP and NC did the data analysis. All authors have seen and approved the final version of the manuscript.

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References

Anderson RA, Corazzini KN, McDaniel RR, Jr. Complexity science and the dynamics of climate and communication: reducing nursing home turnover. *Gerontologist, 44*(3), 2004; 378-388.

Barnighausen T, Bloom DE. Financial incentives for return of service in underserved areas: a systematic review. *BMC Health Serv Res, 9*, 86. doi: 10.1186/1472-6963-9-86: 2009.

Blaauw D, Erasmus E, Pagaiya N, Tangcharoensathein V, Mullei K, Mudhune S, Lagarde M. Policy interventions that attract nurses to rural areas: a multicountry discrete choice experiment. *Bull World Health Organ, 88*(5), 350-356. doi: 10.2471/BLT.09.072918: 2010.

Buykx P, Humphreys J, Wakerman J, Pashen D. Systematic review of effective retention incentives for health workers in rural and remote areas: towards evidence-based policy. *Aust J Rural Health, 18*(3), 102-109. doi: 10.1111/j.1440-1584.2010.01139.x: 2010.

Hanson K, Jack W. Incentives could induce Ethiopian doctors and nurses to work in rural settings. *Health Aff (Millwood), 29*(8), 1452-1460. doi: 10.1377/hlthaff.2009.0164: 2010.

Huicho L, Miranda JJ, Diez-Canseco F, Lema C, Lescano AG, Lagarde M, Blaauw D. Job preferences of nurses and midwives for taking up a rural job in peru: a discrete choice experiment. *PLoS One, 7*(12), e50315. doi: 2012. 10.1371/journal.pone.0050315

Hunt ST. Nursing turnover: Costs, Cause & Solutions. Retrieved from website: http://www.uexcel.com/resources/articles/NursingTurnover.pdf: 2009.

Lang TA, Hodge M, Olson V, Romano PS, Kravitz RL. Nurse-patient ratios: a systematic review on the effects of nurse staffing on patient, nurse employee, and hospital outcomes. *J Nurs Adm, 34*(7-8), ; 2004: 326-337.

Lea J, Cruickshank M. Factors that influence the recruitment and retention of graduate nurses in rural health care facilities. *Collegian, 12*(2), 2005; 22-27.

Perrin ME, Hagopian A, Sales A, Huang B. Nurse migration and its implications for Philippine hospitals. *Int Nurs Rev, 54*(3), 219-226. doi: 10.1111/j.1466-7657.2007.00567.x: 2007.

Smith S, Edwards H, Courtney M, Finlayson K. Factors influencing student nurses in their choice of a rural clinical placement site. *Rural Remote Health, 1*(1), 2001; 89.

Thaker SI, Pathman DE, Mark BA, Ricketts TC, 3rd. Service-linked scholarships, loans, and loan repayment programs for nurses in the southeast. *J Prof Nurs, 24*(2), 122-130. doi: 10.1016/j.profnurs. 2008; 2007.06.022