

# Factors Affecting the Retention of Thai Paramedics in Emergency Medical Service

Thongpitak Huabbangyang PMD, BPH, MSc<sup>1</sup>, Prugsa Rakarcheep PMD<sup>2</sup>, Kittima Kaewsurin PMD<sup>2</sup>, Thanidtha Nomrabporn PMD<sup>2</sup>, Tannapat Warangphongsi PMD<sup>2</sup>

<sup>1</sup> Department of Disaster and Emergency Medical Operation, Faculty of Science and Health Technology, Navamindradhiraj University, Bangkok, Thailand

<sup>2</sup> Bachelor of Science Program in Paramedicine, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand

**Objective:** To study the factors related to the rate of retention of Thai paramedics working in emergency medical service (EMS).

**Materials and Methods:** Data were collected from paramedics all-over Thailand who decided to renew their 5-year license and were registered with the National Institute for Emergency Medicine (NIEMS). The present study was a cross-sectional study. Questionnaires were sent out between March 1 and March 31, 2021 via email, using Google forms.

**Results:** Three hundred eighty-two questionnaires were sent, and 281 responses (74%) were obtained. Most were female (61.9%). The average age was 26.09±4.44 years. Median employment period was two years. At present, 89% of the cohort were still working as paramedics. The majority expect to continue the job for more than 10 years (41.6%). Factors affecting the retention rate were having an income of more than 15,000 Baht per month. The retention rate for the higher earning group was 11.27 times greater (adjusted OR 11.27, 95% CI 4.37 to 29.09, p<0.001) than those earning less than 15,000 Baht per month. In addition, as the mean professionalism score increased, the retention rate increased 3.63 times (adjusted OR 3.63, 95% CI 1.53 to 8.60, p=0.003).

**Conclusion:** Remuneration and professionalism were the two factors related to the retention of the Thai paramedics in EMS. Perceived challenges to retention include professional council establishment and the Health Profession Act.

**Keywords:** Emergency Medical Service; Paramedics; Retention

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Paramedicine is a new profession in Thailand, however, internationally it is well-known and paramedics are widely accepted in multidisciplinary teams<sup>(1)</sup>. The main roles of paramedics are ambulance operation, advanced life support (ALS) team leaders, positioning at a dispatch center, and working within an emergency room (ER) in hospital. Their duties in Thailand include advanced medical procedures, as stated in the Emergency Medical Act of B.E. 2551<sup>(2)</sup>. A systematic review<sup>(3)</sup> has found that the paramedics' burnout rate ranged between 16% and 56% and suggested a relationship of work and income. The retention of healthcare professionals

has been explored in many previous studies such as nurses<sup>(4-7)</sup>, physicians<sup>(8)</sup> and dentists<sup>(9)</sup>, however, that of paramedics has been explored in a limited manner. This may be due to paramedicine being a profession existing for a short time and not well-known to laypeople, or even medical professionals. Now, paramedics face many problems such as lack of acceptance by other healthcare professionals and lack of profession council, leading to resignation from their paramedic positions.

The aims of the present study were to study factors affecting the retention of paramedics and survey the retention rate of Thai paramedics working in emergency medical services (EMS).

## Correspondence to:

Huabbangyang T.

Department of Disaster and Emergency Medical Operation, Faculty of Science and Health Technology, Navamindradhiraj University, Bangkok 10300, Thailand.

**Phone:** +66-2-22443878

**Email:** [thongpitak@nmu.ac.th](mailto:thongpitak@nmu.ac.th)

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## Objective

The objective of the present study was to study factors affecting the retention of Thai paramedics and survey the retention rate of Thai paramedics in EMS.

## Materials and Methods Study design and setting

The present study design was a cross-sectional survey. The samples were all Thai paramedics registered with the National Institute for Emergency

Medicine (NIEMS). The questionnaire data were collected between March 1 and March 31, 2021. The inclusion criteria were being registered with NIEMS and having decided to renew their 5-year license. Exclusion criteria were incomplete contact data in the NIEMS database such as lack of e-mail or having declined to participate. The present study was approved by the Institutional Review Board of Faculty of Medicine Vajira Hospital, Navamindradhiraj University (COA 035/2564).

### Variables and outcomes measure

Price and Mueller's causal model of turnover was applied to the questionnaire data (Price and Mueller, 1981). Job satisfaction, professionalism, generalized training, and kinship responsibility were found to be factors affecting retention<sup>(10)</sup>. Notable factors concerning retention found in the literature include remuneration<sup>(11,12)</sup>, career advancement opportunities<sup>(11,12,14)</sup>, work-life balance<sup>(11,12,14)</sup>, relationships<sup>(11,13)</sup>, and stress<sup>(14)</sup>. The questionnaire was examined using a content validity index (CVI) by two emergency physicians and a paramedic instructor. The content validity index of all questions was 1. The questionnaire included two parts. Part one contained 12 questions in reference to participants' gender, age, income, income satisfaction, employment period, graduation year, working area, current position, workplace, marital status, and further asked "Are you currently a paramedic?" and "How many years do you expect to be a paramedic?". The second part concerning the employee retention included 34 closed-ended questions, allowing participants to choose only one answer. Answers were recorded using a 5-point Likert Scale, with 5 being highest, 4 being high, 3 being neutral, 2 being low and 1 being lowest. The second part was validated through trial by 30 paramedics. The reliability index, calculated using Cronbach's alpha, was 0.875, which indicated a high level of reliability. The scoring criteria of the questionnaire was divided into five categories, in accordance with mean scores (Best and Kahn, 1986). Mean scores of 4.21 to 5.00, 3.41 to 4.20, 2.61 to 3.40, 1.81 to 2.60, and 1.00 to 1.80 indicated highest, high, medium, low, and lowest, respectively<sup>(15)</sup>. The questionnaires created using Google forms were sent to the paramedics by email. The deadline to respond was 30 days.

### Sample size calculation

Sample size determination was done, and design effect was used for sample size adjustment<sup>(16)</sup>. Sample

size, referring to the number of certified paramedics registered with NIEMS before December 2021, was 438. The level of significance ( $\alpha$ ) was 0.05. A population proportion ( $p$ ) of 0.498 was used, which was the retention rate of operating room nurses at Siriraj Hospital, as reported by Konping's study<sup>(13)</sup>. The calculated sample size was at least 205. After an additional 20% of sample size was added to compensate for the non-response rate, using the formula<sup>(17)</sup> [ $n_{\text{new}} = 205/(1-0.20)$ ], the sample size was 257. Hence, a sample size of 260 was targeted. The results were reported utilizing descriptive statistics, which were separated into two parts, depending on the data category. Qualitative data comprised of gender, marital status, working area, current position, workplace, and income satisfaction were reported with frequency distribution and percentage. Quantitative data comprised of age, income, employment period, graduation year, job satisfaction, professionalism, generalized training, kinship responsibility, remuneration, career advancement opportunities, work-life balance, relationship, and stress were reported using means with standard deviation (SD) or median with interquartile range (IQR) as appropriated. The participants' intended career durations were evaluated for factors affecting retention. Crude analysis was used in the assessment of the retention of Thai paramedics in EMS. For quantitative data, frequency distribution and percentage were reported as well as comparisons between groups continuing and discontinuing working as paramedics, using the chi-squared test or Fisher's exact test, depending on appropriateness of the data. For quantitative data, mean with SD were reported and comparisons between groups continuing and discontinuing working as paramedics, using independent sample t-test and multivariate analysis with multiple logistic regression analysis. Odds ratios (OR) and 95% confidence intervals (CIs) were described.

The IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, NY, USA) was used. All statistical tests were considered statistically significant at p-value less than 0.05.

## Results

### Patient characteristics

Of the 382 questionnaires sent, 281 responded (74%), with most being female (61.9%). The average age was 26.08 years (SD 4.46). Most had income of 15,001 to 25,000 Baht per month and 51.2% were satisfied with their income. Most of the participants

**Table 1.** Personal factors (n=281)

Variables	n (%)
Sex	
Male	174 (61.9)
Female	107 (38.1)
Age (year); mean±SD	26.08±4.46
Income (Baht per month)	
Less than 15,000	58 (20.6)
15,001 to 25,000	132 (47.0)
25,001 to 35,000	67 (23.8)
More than 35,000	24 (8.5)
Income satisfaction	
Yes	144 (51.2)
No	137 (48.8)
Employment period (year); median (IQR)	2 (1 to 3)
Graduation year; median (IQR)	2018 (2559 to 2562)
Working area	
Bangkok	116 (41.3)
Provinces	165 (58.7)
Current position	
Paramedic	198 (70.5)
Ministry of Public Health officer	23 (8.2)
Temporary employee	15 (5.3)
Public health scholar/public health officer	13 (4.6)
Teacher/teacher assistant	17 (6.0)
Student	2 (0.7)
Other	13 (4.6)
Marital status	
Single	250 (89.0)
Married	29 (10.3)
Widowed/divorced	2 (0.7)
Paramedic	
No	31 (11.0)
Yes	250 (89.0)
Sector	
Government	201 (80.4)
Private	49 (19.6)
Expected number of years being a paramedic	
Less than 1	16 (6.4)
1 to 5	54 (21.6)
5 to 10	76 (30.4)

SD=standard deviation; IQR=interquartile range

worked provincially (87%). The most common current positions were paramedic (70.5%), ministry of public health officer (8.2%), and temporary employee (5.3%). Most participants worked as paramedics

**Table 2.** Factors affecting retention

Factors	Mean	SD	Meaning
Job satisfaction	3.59	0.48	High
Professionalism	4.03	0.51	High
Generalized training	4.68	0.50	Highest
Kinship responsibility	4.00	0.58	High
Remuneration	3.25	1.13	Medium
Career advancement opportunities	3.32	1.09	Medium
Work-life balance	3.49	0.92	High
Relationship	4.09	0.72	High
Stress	3.37	1.08	Medium

SD=standard deviation

(89%), 80.4% worked in government organizations, and 41.6% planned to continue the job over 10 years (Table 1).

### The retention of Thai paramedics in emergency medical service

For the factors affecting retention, the overall mean scores for job satisfaction were high with a mean of 3.59 (SD 0.48). Generalized training was highest with a mean of 4.68 (SD 0.50), followed by relationship with a mean of 4.09 (SD 0.72), professionalism with a mean of 4.03 (SD 0.51), kinship responsibility with a mean of 4.00 (SD 0.58), work-life balance with a mean of 3.49 (SD 0.92), stress with a mean of 3.37 (SD 1.08), career advancement opportunities with a mean of 3.32 (SD 1.09), and remuneration with a mean of 3.25 (SD 1.13) (Table 2).

### Factors affecting the retention of Thai paramedics in emergency medical service

Statistically significant factors concerning the retention of Thai paramedics in EMS ( $p<0.05$ ) were identified as age, income, working area, and professionalism using univariate binary logistic regression analysis. Each additional year of age increased retention by 15% (OR 1.15, 95% CI 1.01 to 1.30,  $p=0.040$ ). The group whose income was more than 15,000 Baht per month had 12.09 times the chance (OR 12.09, 95% CI 5.27 to 27.73,  $p<0.001$ ) of continuing being paramedics than the group receiving less than 15,000 Baht monthly. The cohort working in the provincial areas were 3.43 times as likely (OR 3.43, 95% CI 1.55 to 7.59,  $p=0.002$ ) to stay on as paramedics than the cohort working in Bangkok. Moreover, for each 1-point increase in mean professionalism score, retention increased 2.81 times

**Table 3.** Univariate analysis and multivariate analysis regarding factors affecting the retention of Thai paramedics in emergency medical service using multiple logistic regression analysis

Personal factors	Univariable analysis			Multivariable analysis		
	OR <sup>1</sup>	95% CI	p-value	OR <sub>adj</sub> <sup>2</sup>	95% CI	p-value
<b>Sex</b>						
Male	1.00	Reference				
Female	1.58	0.70 to 3.56	0.275			
Age (year)	1.15	1.01 to 1.30	0.040	1.01	0.91 to 1.13	0.795
<b>Income (Baht per month)</b>						
Less than 15,000	1.00	Reference		1.00	Reference	
More than 15,000	12.09	5.27 to 27.73	<0.001	11.27	4.37 to 29.09	<0.001
<b>Income satiation</b>						
Yes	1.52	0.72 to 3.24	0.274			
No	1.00	Reference				
<b>Marital status</b>						
Married/widowed/divorced	1.00	Reference				
Single	0.85	0.24 to 2.98	0.799			
Employment period (year)	1.25	0.95 to 1.65	0.106			
Graduation year	0.89	0.75 to 1.07	0.230			
<b>Working area</b>						
Bangkok	1.00	Reference		1.00	Reference	
Provinces	3.43	1.55 to 7.59	0.002	1.60	0.59 to 4.33	0.358
<b>Current position</b>						
Other	1.00	Reference				
Paramedic	0.97	0.43 to 2.21	0.948			
<b>Sector</b>						
Government	1.00	Reference				
Private	2.28	0.66 to 7.79	1.191			
<b>Factors affecting retention</b>						
Job satisfaction	1.28	0.57 to 2.87	0.543			
Professionalism	2.81	1.29 to 6.12	0.009	3.63	1.53 to 8.60	0.003
Generalized training	1.34	0.69 to 2.59	0.393			
Kinship responsibility	1.60	0.84 to 3.04	0.154			
Remuneration	0.82	0.58 to 1.15	0.253			
Career advancement opportunities	0.82	0.58 to 1.18	0.288			
Work-life balance	1.24	0.83 to 1.84	0.297			
Relationship	1.56	0.95 to 2.55	0.077			
Stress	0.95	0.67 to 1.35	0.772			

OR=odds ratio; OR<sub>adj</sub>=adjusted odds ratio; CI=confident interval

Variable was included in multivariate model due to have p-value <0.050 in univariable analysis

<sup>1</sup> Crude odds ratio estimated by binary logistic regression, <sup>2</sup> Adjusted odds ratio estimated by multiple logistic regression

(OR 2.81, 95% CI 1.29 to 6.12, p=0.009). Statistically significant factors, discovered using univariate analysis, were evaluated in multivariate analysis using multiple logistic regression analysis. Income and professionalism were the statistically significant

factors identified in the multivariate analysis, after controlling for confounding factors. The group whose income was more than 15,000 Baht per month had an 11.27 times greater chance (adjusted OR 11.27, 95% CI 4.37 to 29.09, p<0.001) of carrying on being

paramedics than the group who received less than 15,000 Baht monthly. In addition, for each 1-point increase in the mean professionalism score, retention increased 3.63 times (adjusted OR 3.63, 95% CI 1.53 to 8.60,  $p=0.003$ ) (Table 3).

## Discussion

The most important factors of the retention of Thai paramedics in EMS were monthly income of more than 15,000 Baht, which escalated the chances of continuing to work as a paramedic by 11.27 times, compared to those earning less than 15,000 Baht per month, as well as professionalism, which for each 1-point increase in mean score, the retention increased 3.63 times, which is in accordance with the need of Health Profession Act inclusion.

The present study is consistent with studies done on the factors affecting the retention of police nursing students in nursing practice, which were job satisfaction, professionalism, and generalized training that were medium, while kinship responsibility was low<sup>(12)</sup>. Besides, the year of graduation represented did not make any difference, therefore, promotion of supporting factors, good attitude, and professional pride education lead to the retention<sup>(18)</sup>. The study about the retention of operating room nurses in Siriraj Hospital found that professionalism was high. Additionally, all paramedics faced problems and obstacles namely the lack of acceptance of the profession and the lack of a profession council, which were the most important factors of retention<sup>(13)</sup>. Career advancement opportunities and remuneration were the most important factors related to the retention of Israeli paramedics<sup>(12)</sup>, which was comparable to the present study where remuneration and the need to establish a profession council and Health Profession Act inclusion would influence career advancement opportunities in the future.

The most important limitations of the present study were due to most paramedics' average employment period being only two years, perhaps indicating insufficient experience. Secondly, no email and phone number data were presented in the database for older paramedics, hence, they were excluded from the present study. Professionalism was an important factor affecting the retention of paramedics and participants believed that if paramedics were included in the Health Profession Act, their base salary and assignment appropriateness would increase. Therefore, NIEMS and involved institutes should focus on paramedics and promote professional council establishment as soon as possible.

## Conclusion

The overall retention of Thai paramedics was highest. The two important factors were income and professionalism. The group with monthly income of more than 15,000 Baht had a higher mean retention score than the group with less than 15,000 Baht group by 11.27 times. For professionalism, the inclusion into the Health Profession Act could increase the likelihood of retention.

## What is already known on this topic?

Factors affecting the retention of paramedics abroad mostly were remuneration and career advancement opportunities.

## What this study adds?

This study used and added to the Price and Mueller's causal model of turnover (Price and Mueller, 1981), which included job satisfaction, professionalism, generalized training, and kinship responsibility<sup>(10)</sup>. In this study, the authors add the concept of factors relating to the retention of EMS paramedics, which were remuneration, career advancement opportunities, work-life balance, relationship, and stress.

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## Conflicts of interest

No conflicts of interest are to be declared.

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