

## Research article

### Factors Influencing Organ Donation Decision Among Healthcare Personnel at Loei Hospital

Krit Santanapipatkul<sup>1\*</sup>, Kusumarn Ramsiri<sup>2</sup>  
Abhisis Sukjaem<sup>2</sup>, Pronpimon Kumprasert<sup>2</sup>, Chayanan Tanyaphak<sup>2</sup>

<sup>1</sup>Division of urology, Department of Surgery, Loei Hospital

<sup>2</sup>Nursing Service Organization, Loei Hospital

\*Corresponding Author, e-mail: jozaeuro@yahoo.com

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#### Abstract

**Background:** Organ transplantation is the most effective treatment for patients with end-stage organ failure; however, the shortage of donated organs remains a major challenge. Healthcare personnel play a crucial role in promoting organ donation. This study aimed to identify factors influencing the organ donation decisions of healthcare personnel at Loei Hospital to inform the development of provincial-level donation campaigns.

**Methods:** A cross-sectional study was conducted among 556 healthcare personnel from May 10 to June 10, 2025. Data were collected using a questionnaire covering demographic data, knowledge, attitudes, and willingness to donate organs. Generalized Estimating Equation (GEE) analysis was used to assess associations between these factors and organ donation decisions. **Results:** Among the participants, 128 individuals (23%) expressed willingness to donate organs. Moderate (score 4 - 7) and high (score >7) knowledge levels were significantly associated with donation decisions, with adjusted odds ratios (aOR) of 1.80 (95% CI: 1.51 - 2.30,  $p = 0.003$ ) and 1.49 (95% CI: 1.31 - 1.74,  $p < 0.001$ ), respectively. Similarly, moderate (score 25-40) and high (score >40) attitude levels showed stronger associations, with aORs of 4.81 (95% CI: 2.77-11.27,  $p = 0.04$ ) and 5.78 (95% CI: 3.07 - 15.58,  $p = 0.014$ ), respectively. **Conclusion:** Healthcare personnel with at least moderate knowledge and positive attitudes toward organ donation were more likely to choose to donate. Enhancing awareness and attitudes in this group may increase donation rates and support the development of effective institutional and community-based campaigns.

**Keywords:** Organ donation, Knowledge, Attitudes, Healthcare personnel, Loei Hospital

#### Introduction

Organ transplantation remains the most effective treatment for patients with end-stage organ failure, supported by advances in immunology and surgical techniques<sup>1</sup>. However, the global and national demand for organ transplants continues to exceed supply. In Thailand, data from the Thai Red Cross Society (2024) indicated that 7,486 patients were on the waiting list for transplantation, whereas only 936 received organs, reflecting a critical shortage<sup>2</sup>.

Healthcare personnel play a key role in promoting organ donation through patient and family education, initiating early discussions, supporting donor management, and facilitating informed consent with empathy

and effective communication. Their active involvement is crucial for improving donation rates and maintaining ethical standards in the donation process<sup>3,4</sup>.

Previous studies in China have identified several factors influencing organ donation decisions, including social environment, optimism toward death, the desire to leave a meaningful legacy, higher education, urban residency, and religious beliefs. In contrast, research from Iran highlighted humanitarian motivation, understanding of brain death, perceived quality of medical care, positive family experiences, supportive cultural and religious beliefs, and appropriate timing of donation requests as key determinants. These findings indicate that factors influencing organ donation vary across different regions<sup>5,6</sup>.

As Loei Hospital functions as the provincial organ donation center, investigating the factors that influence its healthcare personnel provides critical insights into their knowledge, attitudes, and readiness. These findings can serve as baseline data to inform strategies aimed at enhancing organ donation promotion at the provincial level.

## Methods

This analytical cross-sectional study was conducted among healthcare personnel in Loei Province, including physicians, Dentists, nurses, pharmacists, medical technologists, and other hospital staff, from May 10 to June 10, 2025.

The factors influencing the decision to donate organs were identified through a review of previous studies and included knowledge, attitude, religious beliefs, age, gender, and socioeconomic status. These factors were subsequently used to guide the development of the study questionnaire.

The sample size was calculated using the formula for multiple linear regression models proposed by Hsieh FY, Bloch DA, and Larsen MD (1998)<sup>7</sup>. The calculation was based on literature indicating that gender was a factor influencing the decision to donate organs, with P1 representing the proportion of males willing to donate (43%) and P2 representing the proportion of females (57%). Using a constant sample proportion (B) of 0.5 and a value of P = 0.5, the required sample size was determined to be 530 participants. To compensate for potential missing or incomplete data, an additional 5% was added, resulting in a final sample size of 556 participants.

$$\begin{aligned} n_1 &= \frac{\left[ z_{1-\frac{\alpha}{2}} \sqrt{\frac{P(1-P)}{B}} + z_{1-\beta} \sqrt{P_1(1-P_1) + \frac{P_2(1-P_2)(1-B)}{B}} \right]^2}{(1-B)(P_1 - P_2)^2} \\ P &= (1-B)P_1 + BP_2 \\ n_p &= \frac{n_1}{1-\rho_{1,2...p}^2} \end{aligned}$$

Data were collected using a structured questionnaire developed based on a review of relevant literature on organ donation, including studies by Nordfalk et al.<sup>8</sup>, Symvoulakis et al.<sup>9</sup>, and Dibaba et al.<sup>10</sup>. Content validity was evaluated by three experts: a specialist physician, an advanced practice nurse with expertise in organ donation, and a biostatistician. The Index of Item-Objective Congruence (IOC) for all items exceeded 0.5<sup>11</sup>. Reliability of the questionnaire was assessed using Cronbach's alpha in a pilot study of 30 participants with characteristics similar to the target population, yielding an overall coefficient of 0.87, indicating high internal consistency<sup>12</sup>.

The questionnaire comprised three sections:

- 1. Demographic Data:** Included items such as age, sex, marital status, religion, and education level.
- 2. Knowledge about Organ Donation:** Consisted of 10 multiple-choice questions with one correct

answer each, covering the definition, criteria, and procedures related to organ donation. Scores ranged from 0 to 10, with interpretation as follows:

- o Low: score < 4
- o Moderate: score 4 - 7
- o High: score > 7

**3. Attitudes toward Organ Donation:** Measured using a 5-point Likert scale, ranging from “strongly agree” to “strongly disagree.” Positively worded items were scored from 0 to 4, and negatively worded items were reverse-scored from 0 to 4. The attitude section contained 15 items categorized into four domains:

- o General attitudes toward organ donation (8 items)
- o Beliefs and religion regarding donation (3 items)
  - o Willingness to give and receive organs (2 items)
  - o Special circumstances concerning organ donation (2 items)

The total attitude score ranged from 0 to 60 and was interpreted as:

- o Low: score < 25
- o Moderate: score 25-40
- o High: score > 40

Data were collected using a self-administered online questionnaire distributed to healthcare personnel at Loei Hospital. Participants were invited to complete the survey by scanning a QR code shared through the hospital's internal communication channels. Prior to participation, they were informed about the study objectives, procedures, and data confidentiality. Participation was voluntary, and no identifying information was collected to ensure anonymity. Eligible participants included physicians, nurses, medical technologists, pharmacists, and other hospital staff who consented to participate. The researcher monitored responses to prevent duplicates and excluded incomplete or inconsistent submissions before organizing the data electronically for statistical analysis.

## Statistical Analysis

**1. Descriptive statistics** were used to analyze the general characteristics of the participants. For continuous variables, mean and standard deviation were reported if the data were normally distributed. In cases where data were skewed, the median and interquartile range (IQR) were presented. For categorical variables, frequency and percentage were used.

**2. Univariate analysis** was performed to assess the association between each independent factor and the decision to donate organs after death. Variables with a p-value less than 0.05 and clinical significance based on literature review were considered for further analysis. Crude odds ratios (ORs) and 95% confidence intervals (CIs) were reported.

**3. Multivariate analysis** was conducted using the Generalized Estimating Equation (GEE) method. All independent variables were entered into the model simultaneously (enter method). Adjusted odds ratios (AORs) and 95% confidence intervals were reported.

## Ethical Consideration

Ethical approval for this study was obtained from the Ethics Committee of Loei Hospital (Approval number: EC016/2568) on May 8, 2025. All participants provided informed consent prior to data collection, in accordance with the approved protocol.

All participants were informed of the study objectives, procedures, and their rights prior to participation. An electronic informed consent form was presented before accessing the online questionnaire via QR code, emphasizing voluntary participation, anonymity, the right to withdraw at any time, and exclusive use of data for research purposes. No personal identifiers were collected. Data were securely stored in a database accessible only to the researcher, ensuring participants' privacy, rights, and human dignity throughout the study.

## Results

This study was conducted from May 10 to June 10, 2025. A total of 705 questionnaires were distributed, of which 637 were returned. Among the returned questionnaires, 81 were incomplete, resulting in 556 fully completed responses included

in the analysis. Among them, 489 participants (87.95%) were female and 67 (12.05%) were male. The vast majority were Buddhist (552 participants, 99.28%) and held a bachelor's degree (442 participants, 79.5%). Most participants reported receiving information about organ donation through electronic media, accounting for 220 individuals (39.6%), as shown in Table 1.

**Table 1.** General Characteristics of Participants (n = 556)

Characteristics	Number	Percentage (%)
<b>Sex</b>		
Female	489	87.95
Male	67	12.05
Age: Median [IQR]	32	(16)
<b>Religion</b>		
Buddhism	552	99.28
Others	4	0.72
<b>Occupation</b>		
Government official*	403	72.48
Daily-wage employee**	22	3.96
Monthly-wage employee***	32	5.76
Ministry employee****	88	15.83
Contract government officer*****	2	0.36
Student	9	1.62
<b>Education Level</b>		
Primary school	2	0.36
Secondary school	70	12.59
Vocational certificate	35	6.29
Bachelor's degree	442	79.50
Higher than bachelor's degree	7	1.26
<b>Monthly Income (Baht)</b>		
< 5,000	8	1.44
5,000 - 30,000	271	48.74
30,000 - 60,000	250	44.96
60,000 - 90,000	21	3.78
90,000 - 120,000	4	0.72
120,000 - 150,000	2	0.36
<b>Source of Information on Organ Donation</b>		
None	58	10.43
Television	31	5.58
Newspaper	1	0.18

Characteristics	Number	Percentage (%)
Pamphlet	11	1.98
Colleagues	206	37.05
Electronic media	220	39.57
Others	29	5.22

\*Government officials include healthcare professionals such as physicians, dentists, pharmacists, nurses, and medical technologists.

\*\*Daily-wage employees include support staff such as hospital assistants, orderlies, cleaners, security personnel, and administrative aides.

\*\*\*Monthly-wage employees include administrative staff, clerks, accounting officers, data entry personnel, and office assistants.

\*\*\*\*Ministry employees include specialized officers assigned by the Ministry of Public Health, such as health program coordinators, policy officers, and public health specialists.

\*\*\*\*\*Contract government officers include medical and non-medical staff hired under fixed-term contracts, such as contracted nurses, laboratory staff, administrative staff, and technical support personnel.

**Data analysis using the Generalized Estimating Equation (GEE) revealed that** factors significantly associated with the decision to donate organs included the level of knowledge and attitude regarding organ donation. Participants with a moderate level of knowledge about organ donation (score 4 - 7) had an adjusted odds ratio (aOR) of 1.80 (95% CI: 1.51 - 2.30, p = 0.003), and those with a high level of knowledge (score >7) had an aOR of 1.49 (95% CI: 1.31 - 1.74, p < 0.001). Additionally, participants with a moderate level of attitude toward organ donation (score 25 - 40) had an aOR of 4.81 (95% CI: 2.77 - 11.27, p = 0.04), and those with a high level of attitude (score >40) had an aOR of 5.78 (95% CI: 3.07 - 15.58, p = 0.014), as shown in Table 2.

**Table 2.** Univariable and multivariable analysis of factors associated with organ donation decisions among healthcare personnel at Loei Hospital.

Factors	Univariable OR	95% CI	p-value	Multivariable AOR	95% CI	p-value
Summation of knowledge score						
< 4 points (Ref)	Ref	-	-	Ref	-	-
4-7 points	1.83	1.54 - 2.38	0.005	1.80	1.51 - 2.30	0.003
> 7 points	1.49	1.32 - 1.75	< 0.001	1.49	1.31 - 1.74	< 0.001
General attitudes toward organ donation						
< 15 points (Ref)	Ref	-	-	Ref	-	-
15-20 points	0.96	0.22 - 4.09	0.951	1.18	0.25 - 5.68	0.833
> 20 points	0.56	0.13 - 2.39	0.436	0.80	0.16 - 3.93	0.786
Attitudes toward beliefs and religion						
< 4 points (Ref)	Ref	-	-	Ref	-	-

Factors	Univariable	95% CI	p-value	Multivariable		95% CI	p-value
				OR	AOR		
4–8 points	0.96	0.11 - 0.70	0.968	0.73	0.07 - 7.44	0.796	
> 8 points	0.48	0.05 - 4.49	0.517	0.41	0.04 - 4.25	0.454	
Attitudes toward willingness to donate/receive organs							
< 3 points (Ref)	Ref	-	-	Ref	-	-	-
3–6 points	0.54	0.23 - 1.26	0.157	0.57	0.23 - 1.43	0.233	
> 6 points	0.45	0.18 - 1.12	0.085	0.65	0.23 - 1.77	0.399	
Attitudes toward special circumstances							
< 3 points (Ref)	Ref	-	-	-	-	-	-
3–6 points	0.94	0.44 - 2.01	0.874	-	-	-	-
> 6 points	1.07	0.46 - 2.45	0.871	-	-	-	-
Summation of attitude score							
< 25 points (Ref)	Ref	-	-	Ref	-	-	-
25–40 points	0.95	0.22 - 4.08	0.436	4.81	2.77 - 11.27	0.040	
> 40 points	0.41	0.09 - 1.96	0.267	5.78	3.07 - 15.58	0.014	

## Discussion

Organ donation shortage is not only a problem in Thailand but also a global concern<sup>13</sup>. This study aimed to identify factors associated with the decision to donate organs among healthcare personnel in Loei province, with the goal of informing strategies to increase organ donation rates.

The findings revealed that 128 participants (23%) had donated organs. The analysis showed that participants with moderate and high levels of knowledge regarding organ donation were more likely to donate compared to those with low knowledge, with adjusted odds ratios (aORs) of 1.80 and 1.49, respectively. However, when considering attitudinal factors, it was found that positive attitudes toward organ donation had the greatest influence on the decision to donate. Participants with moderate and high levels of attitude scores had significantly higher likelihoods of organ donation, with aORs of 4.81 and 5.78, respectively, compared to those with low attitude scores.

These results indicate that a positive attitude has a statistically significant relationship with organ donation decisions and may have a greater impact than knowledge alone. Therefore, promoting and enhancing positive attitudes among healthcare personnel, especially through improved understanding of the benefits of organ donation and reducing fears and misconceptions, may effectively increase organ donation rates within this target group.

This study aligns with Conesa et al., who reported that adolescents with higher education levels showed more positive attitudes toward organ donation, emphasizing the value of early educational interventions<sup>14</sup>. Similarly, research in India among medical students found that greater knowledge and positive attitudes were linked to higher willingness to donate<sup>15</sup>.

Furthermore, a study conducted in the central region of Thailand found that one of the primary reasons families refused organ donation was the belief that the deceased would be reincarnated without complete organs<sup>16</sup>. This issue aligns with beliefs commonly found in many Asian countries<sup>17,18</sup>. However, in this study, healthcare personnel in Loei province who donated organs were less likely to hold such beliefs, possibly due to their higher levels of knowledge and more positive attitudes toward organ donation.

A 2004 national survey found that people in northeastern Thailand had lower knowledge of organ donation than other regions, despite generally positive attitudes. By 2015, however, hospitals in this region reported the highest number of organ donors nationwide (58%), indicating a marked improvement likely resulting from continuous education and awareness campaigns promoting organ donation<sup>19</sup>.

In the present study, it was found that healthcare personnel in Loei province most frequently accessed organ donation information via electronic media, with 220 individuals (39.57%) reporting this source. This finding aligns with several previous studies indicating that the internet has become a widespread medium for accessing organ donation information in recent years<sup>10,22,21</sup>. Therefore, promoting organ donation through internet-based campaigns could be an effective strategy for increasing public knowledge and fostering positive attitudes toward donation.

While organ donation remains a limited practice in Thailand, this study contributes valuable insights into the factors influencing donation decisions. These findings may help inform strategies to increase organ donation rates in the future. However, since the study was conducted only at Loei Hospital, the results may not be generalizable to healthcare personnel throughout the country.

Based on the study findings, it is recommended to expand the population to include healthcare personnel from district hospitals or neighboring provinces to compare attitudes and influencing factors across settings. The results can also guide the development of systematic strategies or provincial-level action plans to enhance organ donation.

## Conclusion

Organ donation is a critical treatment for patients with organ failure. However, the number of organ donors remains significantly lower than the number of patients awaiting transplantation. This study demonstrated that having at least a moderate level of knowledge about organ donation (score  $\geq 4$ ) and a moderate or higher level of attitude (score  $\geq 25$ ) were significantly associated with the decision to donate organs. These findings indicate that enhancing knowledge and attitudes toward organ donation among healthcare personnel may increase donation rates and inform the development of effective institutional and community campaigns.

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## Citation

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