

# Using Competency Based Training to Developed Nursing Services in the Medical Tourism Industry in Thailand

**Khwanjai Wongchuay**

Faculty of Management Sciences, Prince of Songkla University, Songkla, Thailand  
rhytraining@gmail.com

**Kaedsiri Jaroenwisan**

Department of Business Administration, Faculty of Management Sciences,  
Silapakprorn University, Bangkok, Thailand  
Kaedsiri.j@gmail.com

## Abstract

The objectives of this research were to identify the core competencies for nursing services and determine the training course for nurse staffs regarding medical tourism service system on private hospitals in Thailand. Quantitative data were collected by using the questionnaires from 96 nurse staff respondents. The index content validity of those questionnaires was tested with I-CVI method and overall content validity was tested with S-CVI/Ave, both of them valued 0.87 passing criteria was defined, and tested reliability with Cronbach's alpha was 0.96. Data were analyzed using frequency, percent, mean, standard deviation, one-way Anova, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

The findings indicated that the competency based training course were 3 subjects: 1) Caring for elderly patients in elderly top 5 diseases, including heart disease, cancer, stroke, pneumonia and chronic obstructive pulmonary disease (COPD). 2) Medical Investigation; physical examination, assessment of the health history, X-ray testing, and ultrasound testing, 3) Preparation for medical diagnostics; cervical cancer screening, eye examination, preparing patients cosmetic surgery and preparing patients orthopedic surgery.

**Keywords:** medical tourism, nursing services, competency, training, service, private hospitals

## Introduction

A growing phenomenon especially in many countries of Southeast Asia has emerged in recent years. It's called, "medical tourism." Patients travel from their home country to foreign countries' hospitals and clinics seeking medical care. Nurses play a significant role in the perception by patients of quality of care. Of course doctors are perhaps the most important factor by which patient care is evaluated, but from the patient's perspective, both doctors and nurses create the basis of patient's experience of the quality of the medical care at a hospital. This paradigm shift in hospital care for increasing numbers of foreigners has put the spotlight on nursing care. The challenge now facing hospital nursing staffs and their managers is meeting the professional medical care standards as well as providing a spirit of caring and understanding. In Thailand in particular, the "Land of Smiles," this service attitude is ingrained for many Thais as a shared cultural value. However, a major contributor reason for this attitude is also based on the fact that Thailand relies on the service industry for 44% of its GDP, including tourism. (Schwab, 2010) Indeed, when it comes to the medical tourism market

Thailand is not alone. According to service quality surveys, Thailand and Singapore, for example, are ranked equally at 5.4 while Japan scored 6.4 in a comparative ranking. (Pattamaroj, 2012) With the recent push by the government in Thailand to be a leading partner in the newly formed confederation of Southeast Asian Nations, (ASEAN) there has been a growing awareness in the nursing profession that in order to compete effectively and to do a better job in addressing the needs of the medical tourist industry a better model for nurses' training was needed.

A quick overview illustrates the situation. Private hospitals offering world-class medical services have resulted in increased demand from overseas patients. (NaRanong & NaRanong, 2011) While Thailand is a leading medical hub for medical tourism, it is followed closely by India. As a means of creating an international standard for evaluating care by overseas hospitals the "Joint Committee International" standard, (JCI) was created in the United States. The number of hospitals certified as meeting the JCI standard in Southeast Asia as of 2011 are as follows: Singapore, 18 hospitals, Thailand 13 hospitals, and Malaysia 7 hospitals. (Noree, Hanefeld & Smith, 2016) Furthermore, a study of "complicated treatments" in Thailand and India revealed that India's hospitals had 16.7 %, while in Thailand the total was 15%. (Ruggeri, et al., 2015)

Among the key factors when considering treatment outside of the medical tourist's home country are many considerations including: politics, economics, climate, professional standards, regulatory standards, quality assurance services, and of course, cost. (Smith & Forgione, 2007) A further incentive has been the relative decline in travel costs, making international travel destinations more accessible to greater numbers of people. In addition, another key factor for patients choosing to treatment outside of one's home country is the question of insurance coverage. For example, in 2013 a striking number — 27% percent of American women between 45-64 years old with annual incomes between \$50,000-\$100,000 USD were not covered by health insurance and sought medical treatment in another country. The obvious conclusion to be drawn was the cost savings of up to 80% for treatment abroad. Consider this dramatic illustration — in the United States, for example, pelvic orthopedic surgery often costs in the neighborhood of \$39,000 plus hospital expenses which may be considerable, whereas, in Thailand the cost will be closer to \$3,000. (Kotler, Hermawan, & Den, 2015)

All this has put increasing competitive pressure on the nursing profession. Another way to grasp the impact medical tourism is having on hospitals, is the fact that two major private hospitals in Bangkok-Bumrungraj and Yanhee hospitals provide more than ten interpreters in their hospitals, and had elderly care departments specializing in providing care and services for elderly people from abroad. (NaRanong, 2011) With this increasing demand for better quality medical treatment, including nursing care, the medical tourism industry evinces a concomitant need for improved nurses' training in core areas of medical competencies. The main objectives of the research and investigations for this paper were to identify and define the core competencies for nursing services, and determine an optimal training course for nursing staffs in order to meet the demands of the medical tourism patients at private hospitals.

## Literature Review

### 1. Caring for elderly increasing demand

Today's global markets offer greater mobility than ever before. The demographic that most exemplifies this trend is the senior market. Among advanced developed nations, for example, Japan and the United States it is estimated that in the next 25 years Japan's seniors will account for a third of the country's population. In America, it is projected that by 2050 one

in five Americans will be elderly, about eighty million Americans, almost 20% of the total population. (Ghadar & Loughran, 2014). In the U.S., the Center for Disease Control, (CDC) recently disclosed that the five leading causes of death in the elderly were: heart disease, cancer, strokes, pneumonia or influenza and Chronic Obstructive Pulmonary Disease (COPD). For this study, researchers identified the competencies needed to care for foreign elderly in these six major diseases as follows:

- 1) Caring competency to care the elderly patients with heart disease
- 2) Caring competency to care the elderly patients with cancer
- 3) Caring competency to care the elderly patients with stroke
- 4) Caring competency to care the elderly patients with pneumonia
- 5) Caring competency to care the elderly patients with influenza, and
- 6) Caring competency to care the elderly patients with chronic obstructive pulmonary disease

## **2. Health screening Check-ups - medical records from Thailand's largest hospital for treating foreigners provides additional data**

Bumrungrad Hospital's medical records, demonstrate how Bumrungrad Hospital has the highest number of foreign patients in Thailand. Bumrungrad Hospital is then followed by other JCI accredited hospitals. The health check services conducted by nursing staffs consist of eight key areas, or major parts: (Bumrungrad Hospital, 2015).

- 1) Competence with physical examination
- 2) Competence with assessment of the health history
- 3) Competence with laboratory testing
- 4) Competence with X-ray testing
- 5) Competence with ultrasound testing
- 6) Competence with cervical cancer screening
- 7) Competence with eye examination, and
- 8) Competence with giving vaccination.

## **3. Surgery treatment service**

A survey of the surgical services offered by leading private hospitals with foreign patients reflects the majority were comprised of aesthetic plastic surgery treatments, cosmetic treatments, and sex change operations. For these procedures, nursing functions also require additional competencies, for example-competence with preparing patients for cosmetic surgery, competence with preparing patients for orthopedic surgery and, competence with preparing patients for sex change surgery. (Bumrungrad Hospital, 2015).

## **4. Dental care adds to the list of necessary nursing competencies**

According to medical records at Bumrungrad Hospital most foreign patients came to the dental clinic requiring eight kinds of treatments including: general dentistry, pediatric dentistry, orthodontics, root canal treatment, gum disease treatment, denture dentistry, oral surgery and tooth implantation. (Bumrungrad Hospital, 2015). This data provided the basis for additional nurses' competencies for foreign patients who receive dental treatment for adults and children.

In this study, a conceptual model is based on the principles of 'Competency Based Training' (CBT) used by the Association of Southeast Asian Nations, ASEAN. (2012) This

approach describes core competencies into twenty-five critical care area. In applying this model, the many nursing functions are defined according to a list of tasks, referred to as units of competency.

This competency framework was employed in the design of the nurses' survey for this research. The literature reviews on this topic also are classified according to competencies of nursing service indicators of 25 items. For the statistical purposes of this study, these items have been classified according to exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to determine core competencies.

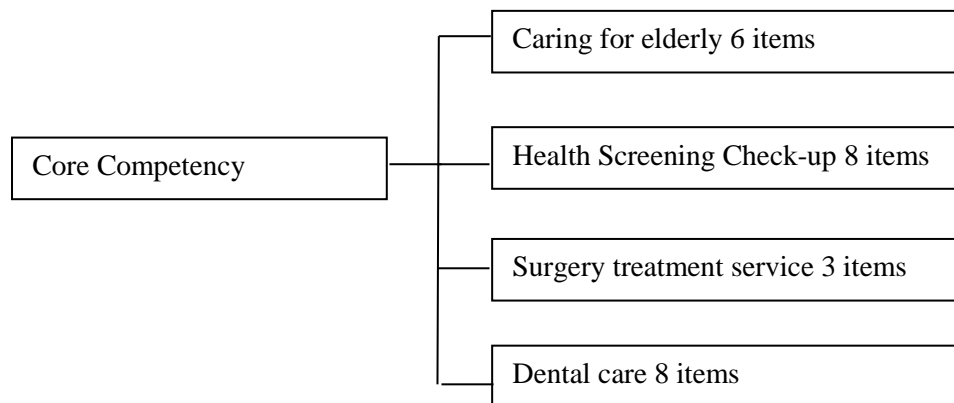


Figure 1. Conceptual Framework

## Methodology

Our study was conducted in three phases. In Phase 1 descriptive research was employed to analyze the model of the core competencies of the nursing staffs. In Phase 2 the model of core competencies was determined by exploratory factor analysis. In Phase 3 researchers applied a model of core competencies by confirmatory factor analysis.

### Phase 1: Creating the model of the core competencies of the nursing staffs

The research for the questionnaire was designed using descriptive research in order to analyze and determine the core competencies of the nursing staffs that care for and attend to foreigners. The questionnaires themselves were developed by literature reviews and were pre-approved by a panel of five experts; The Director of private hospital, specialist in educational development, service provider in tourism industry, instructor in nursing and the nurse practitioner in medical tourism. The index content validity was tested with Item Content Validity Index (I-CVI) method and resulted in values of 0.87, notably high. The overall content validity was tested with Content Validity for Scale/Average Proportion (S-CVI/Ave) and resulted in valued of 0.87 also high. This resulted in a Cronbach's alpha tested internal consistency of 0.96. Quantitative data were collected by using the questionnaires twenty-five items and applying a rating scale of five descriptive levels. Each question pertained directly to the necessary technical competence for nurses providing care to foreigners.

### Survey Participants

The target nurses selected for the study all worked at private hospitals and the questionnaire was completed by 96 respondents from nine different private hospitals in Thailand. Each hospital was accredited by the Joint Commission International (JCI) standard. The initial findings and analysis from the respondent's questionnaires resulted in a clear picture

of the core competencies of the nurses, as well as revealing several areas where further training is needed. A prior assessment of patient populations was determined based on hospital beds assigned to foreigner patients and the estimated nursing staffs, (Thailand Nursing and Midwifery Council, 2005.) Prior to this study there were nineteen hospitals accredited by the JCI standard in Thailand as of 2012. (Kumpong, 2012) The sample size from the number of foreigners admitted to 23 internationally-accredited private hospitals included a population of approximately six patients per ward. The total population was 391. The appropriate sample size was 59-117 in this study. (Pasunon, 2010)

### **The Five Levels of Response Possible on the Questionnaire**

- Level 5: Strongly agree, (average score 4.21-5.00)
- Level 4: Agree, (average score 3.41-4.20)
- Level 3: Neither agree nor disagree, (average score 2.61-3.40)
- Level 2: Disagree, (average score 1.81-2.60)
- Level 1: Strongly disagree, (average score 1.00-1.80)

Data analysis was extracted according to statistical analysis functions - Frequency, Percentage, Mean, and Standard Deviation. Based on the performance needs survey, the researcher selected the level of need for performance at a higher level from past surveys. The indicators will be grouped according to exploratory factor analysis. The results of this research evinced 16 indicators of competencies as follow:

1. Caring competency to care the elderly patients with heart disease.
2. Caring competency to care the elderly patients with cancer.
3. Caring competency to care the elderly patients with stroke.
4. Caring competency to care the elderly patients with pneumonia.
5. Caring competency to care the elderly patients with influenza.
6. Caring competency to care the elderly patients with chronic obstructive pulmonary disease
7. Competence with physical examination.
8. Competence with assessment of the health history.
9. Competence with laboratory testing.
10. Competence with X-ray testing.
11. Competence with ultrasound testing.
12. Competence with cervical cancer screening.
13. Competence with eye examination.
14. Competence with giving vaccination.
15. Competence with preparing patients cosmetic surgery.
16. Competence with preparing patients orthopedic surgery.

### **Phase 2 Developing model of those core competencies by exploratory factor analysis.**

The requirements for a dataset to be suitable for factor analysis must be tested by Bartlett's test of sphericity and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO). The results were passed examine both requirements at .05 significance level, shown as table 1

Table 1. Results of Bartlett's Test of Sphericity

<b>Assumption</b>		<b>value</b>
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.86
Bartlett's Test of Sphericity	Approx. Chi-Square	1450.26
	df	129
	Sig.	.00

A factor extraction method used was based on the principal components analysis technique (PCA). The results of factor extraction chosen revealed the components to have eigenvalue is greater than or equal to 1.0. Factor rotation by promax method, were chosen from factor loading > 0.03 as table 2. (Jaroenwisan, 2009)

Table 2. Factor loading matrix, oblique rotation constrained to factor with eigenvalues &gt; 1

<b>Items</b>	<b>Components</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
1	.86	.46	.39
2	.84	.35	.53
3	.87	.37	.40
4	.89	.37	.41
5	.69	.46	.35
6	.91	.43	.38
7	.54	.80	.24
8	.50	.87	.30
9	.21	.80	.45
10	.37	.86	.62
11	.33	.88	.61
12	.40	.44	.89
13	.47	.52	.90
14	.50	.77	.55
15	.37	.39	.82
16	.54	.59	.73
<b>Eiuevalue</b>	<b>8.03</b>	<b>2.27</b>	<b>1.51</b>
<b>Cumulative%of variance</b>	<b>50.20</b>	<b>64.38</b>	<b>73.80</b>

### Phase 3 Confirmation of a process model of those core competencies by confirmatory factor analysis, CFA

The first requirements for a dataset to be suitable for confirmatory factor analysis must be in normal distribution as table 3.

Table 3. Statistical values for the normal distribution test of components and metrics.

Items	mean	S.D.	skew	kurtosis	min	max
1	4.13	.899	-0.74	-0.35	2	5
2	3.80	.924	-0.26	-0.51	1	5
3	4.16	.845	-0.70	-0.31	2	5
4	3.99	.826	-0.81	0.94	1	5
5	3.90	.754	-0.25	-0.33	2	5
6	3.88	.851	-0.42	0.04	1	5
7	4.07	1.049	-1.14	0.68	1	5
8	4.18	.978	-1.42	1.86	1	5
9	4.13	.785	-1.20	3.00	1	5
10	3.98	.832	-0.47	-0.37	2	5
11	3.99	.838	-0.48	-0.40	2	5
12	3.62	.913	-0.24	-0.39	1	5
13	3.57	.897	0.07	-0.79	2	5
14	3.81	1.048	-1.08	0.73	1	5
15	3.44	1.134	-0.40	-0.50	1	5
16	3.92	1.007	-0.81	0.33	1	5

The result tested reflected an acceptable normal distribution, skewness +1 to -1, Using multidimensional scaling (MDS) for correlation revealed that stress and squared correlation (RSQ) in distances was 0.98 passed criteria ( $0 \leq RSQ \leq 1$ ). (Ryu, 2011) Therefore, these data can be analyzed by confirmatory factor analysis, (CFA).

A confirmatory factor analysis was derived from the factor structure obtained in exploratory analysis. The maximum likelihood method to estimate all model, resulting from confirmatory factor analysis passed the criteria for distribution and no value was inordinately skewed, This was indicative of relative univariate normality for each item. The confirmatory factor analysis fit appropriately

The indices: RMSEA (0.09), CMIN/DF (1.86), RMR (0.08), CFI (0.94), NFI (0.92) were calculated and the findings indicated the correlation between the model and observed structure and determine the core competencies of nurse staffs in medical tourism service. This in turn determine the training course for nurse staffs regarding medical tourism at private hospital in Thailand. The 3 main categories were 1) Caring for elderly patients 2) Medical Investigation 3) Preparation for medical diagnostics as shown in the figure 2.



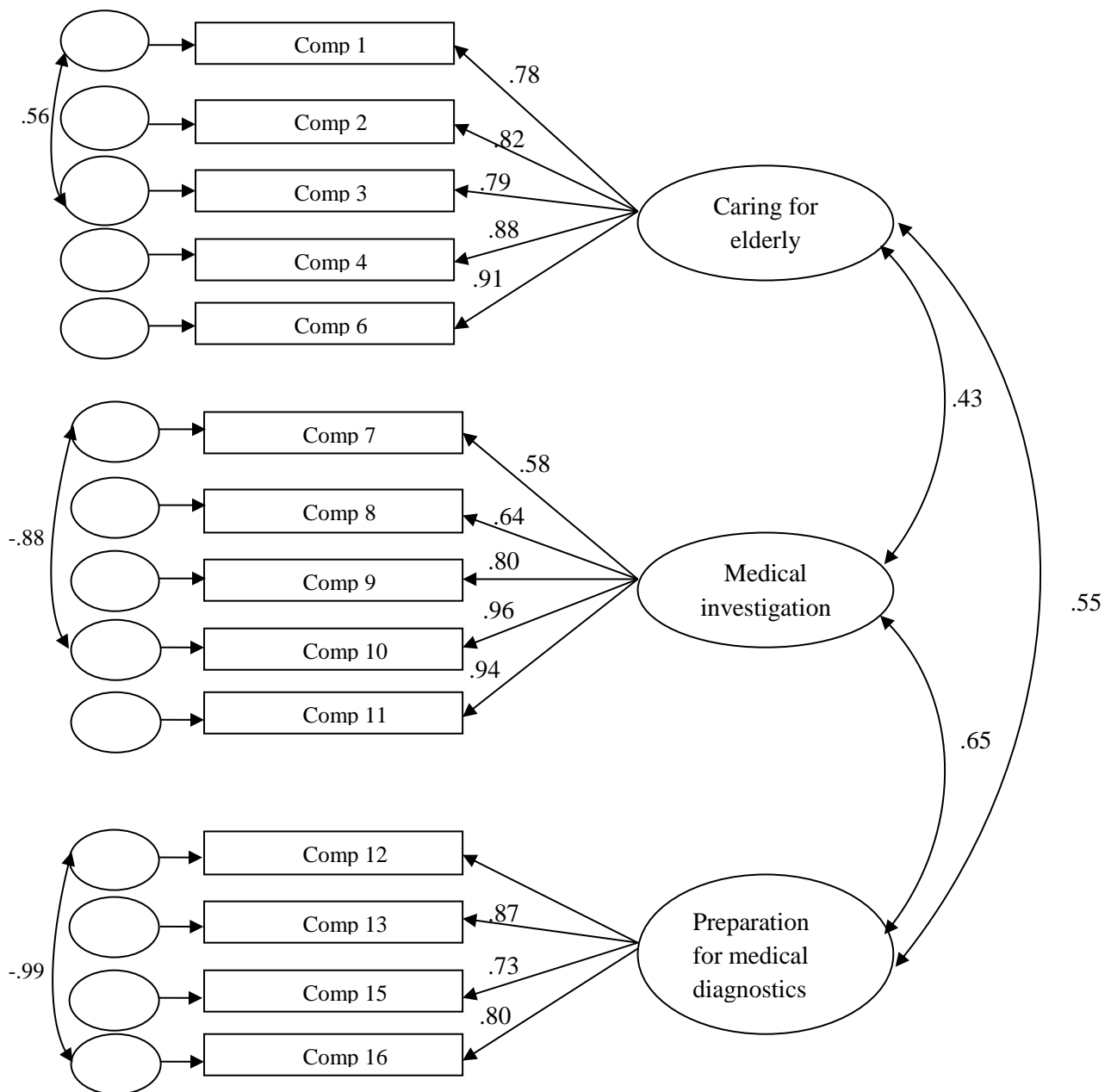


Figure 2. Confirmatory Factor Analysis

## Result

The result of confirmatory factor analysis and exploratory factor analysis indicate that the scale has a structure with 3 factors showed high reliability, with alpha coefficients higher than .80, following the table 4, 5, 6



Table 4. Description of items in factor 1 (caring for elderly)

Item	Description	Loading
1	Caring competency to care the elderly patients with heart disease.	0.86
2	Caring competency to care the elderly patients with cancer.	0.84
3	Caring competency to care the elderly patients with stroke.	0.87
4	Caring competency to care the elderly patients with pneumonia.	0.89
6	Caring competency to care the elderly patients with chronic obstructive pulmonary disease.	0.91

Table 5. Description of items in factor 2 (medical investigation)

Item	Description	Loading
7	Competence with physical examination.	0.80
8	Competence with assessment of the health history.	0.87
9	Competence with laboratory testing.	0.80
10	Competence with X-ray testing.	0.87
11	Competence with ultrasound testing.	0.89

Table 6. Description of items in factor 3 (preparation for medical diagnostics)

Item	Description	Loading
12	Competence with cervical cancer screening	0.89
13	Competence with eye examination	0.90
15	Competence with preparing patients cosmetic surgery	0.82
16	Competence with preparing patients orthopedic surgery	0.73

These results indicate the following structure for training for nursing staffs with respect to medical tourism patients in private hospital in Thailand. See the figure 3.

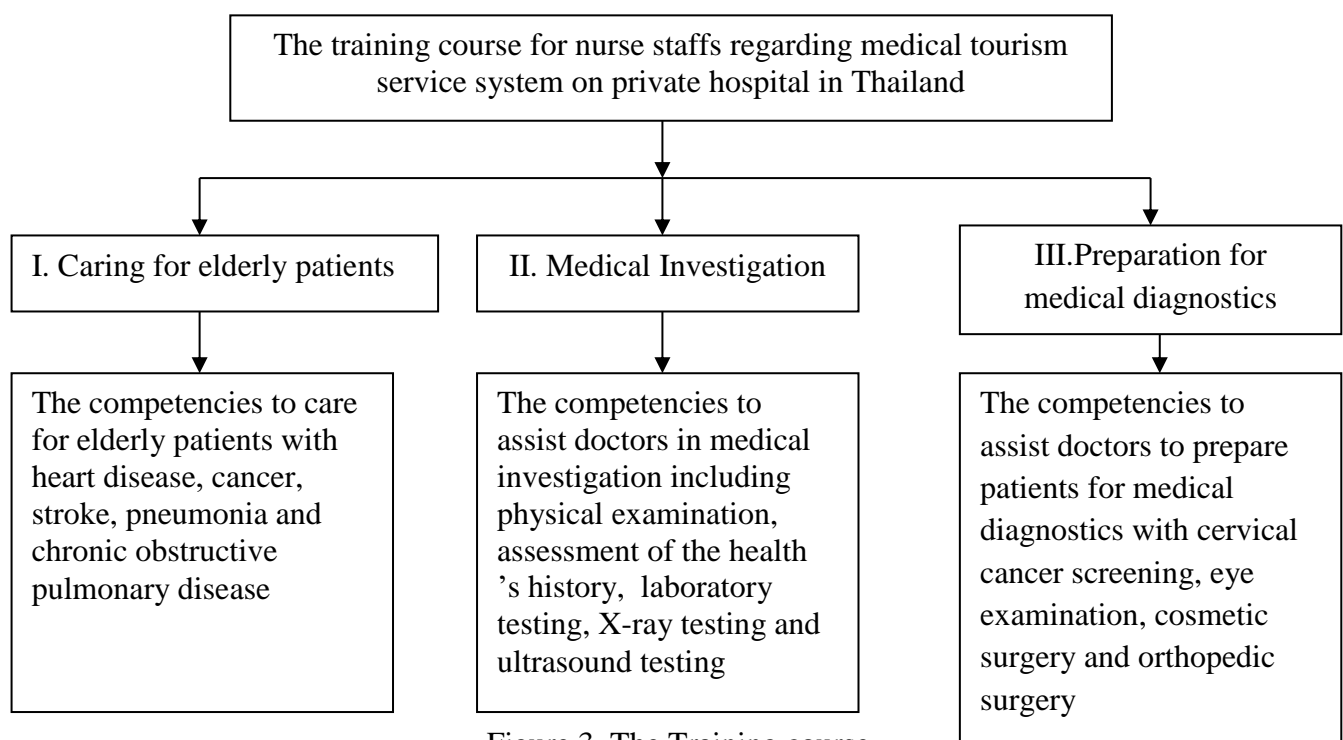


Figure 3. The Training course

## Discussion

Past studies found that nursing staff graduated from various institutions. The course was not to focus on providing to foreign patients who have specific needs are different from Thai, such as in cosmetic surgery, or sex change, but this course can only found some nursing assistants schools. These school offers specialized courses in the care of the elderly and some of which offer specialized Japanese courses.

So, this research was based on the concept on the principles of competency based training (CBT). The results describe a template model of how to develop programs for nurse staffs who attend to foreigners coming for treatment at private hospitals. In summary, the research indicate three main elements:

1) Caring for the elderly consists of competencies to care for elderly patients with heart disease, cancer, stroke, pneumonia and chronic obstructive pulmonary disease. The competencies illustrated below include the patients seeking treatment of stroke, heart disease, pneumonia, chronic obstructive pulmonary disease and cancer. A survey of elderly health by the Center for Disease Control (CDC) in the United States found that the top five causes of mortality of elderly include: heart disease, cancer, stroke, pneumonia/influenza and chronic obstructive pulmonary disease (COPD). These finding are very similar to the elderly population worldwide as table 7

Table 7. The cause of dead in elderly more 65 year old (Sahyoun, Lentzner, Hoyert & Robinson, 2001)

White	Black	American Indian	Asia/Asia Pacific	Hispanic*
heart disease	heart disease	heart disease	heart disease	heart disease
cancer	cancer	cancer	cancer	cancer
stroke	stroke	diabete	stroke	stroke
COPD	diabete	stroke	Pneumonia/influenza	COPD
pneumonia/influenza	pneumonia/influenza	COPD	COPD	pneumonia/influenza

*Note \* A group of Hispanic population is located in Mexico , Puerto Rico, Cuba, South America, Central America, and Caribbean, etc*

2) Medical investigation consists of competencies to perform physical examinations, assessment of the health history, assisting X-ray testing, and ultrasound testing. These competencies related health screening check-ups were derived from research data from foreigners, who came to Thailand from Japan, The United State, and The United Kingdom, Admissions records show patients treated by surgery were about 48%, heart disease 24% and health screening check-ups 16% (Sewasud, 2010). The patients undergoing health check-up programs at Bumrungraj hospital were examined in eight key areas: physical examination, assessment of the health history, laboratory testing, x-ray testing, ultrasound testing, cervical cancer screening, eye examination, and advice on getting the vaccine. This research further confirmed the competency evaluation of professional staff nurses, arranged by descending order including; assessment of the health history, laboratory testing, physical examination, ultrasound testing, X-ray testing, providing advice on getting the vaccine, cervical cancer screening and eye examination.

3) Preparation for medical diagnostics consists of competency to care patients with with cervical cancer screening, eye examination, cosmetic surgery and orthopedic surgery. The research data were again based on hospital records showing foreigners who came from Japan, United State, and United Kingdom admitted in private hospitals in Thailand. Here again most patients were treated by surgery, approximately 48%, of which many were treated for artificial joint replacement surgery, spine surgery and cosmetic surgery. The survey data from

the patients undergoing surgery at private hospital of Thailand also included admissions for cosmetic surgery, orthopedic surgery, and sex change surgery. This research found that the competency of professional staff nurses arranged by descending order including; orthopedic surgery, cosmetic surgery and sex change surgery. (NaRanong & NaRanong, 2011) Many patients from Japan were admitted for orthopedic surgeries, artificial joint replacement surgery, surgery for a lumbar herniated disc, spine surgery and cosmetic surgery

The limitations of this study, only for only foreigners in the private hospital group were studied. However, it can be further developed research to find the needs and increase access to medical tourism services from customers who come to Thailand by researching for different foreign customer-groups, for example in health tourism groups, cultural tourism groups, etc.

Policy Recommendations for Thailand, while the trend of health market for foreign customers is increasing. Specialized nursing courses should be provided in curriculum. For example, the foreigner's care for elderly patients, cosmetic surgery care, etc.

## Conclusions

The results of this research confirmed that the competencies of nurses for medical tourism services consisted of three primary components and 14 items; 1) Caring for the elderly five items 2) Medical investigation five items and 3) Preparation for medical diagnostics four items. The results of this study will be useful to those involved in each of the following:

- 1) Private and government hospitals can apply research information to create training courses for their staff nurses attending to foreign patient.
- 2) Education institutions can apply the research for their managers for building the nursing curriculum.
- 2) Hospitals in ASEAN countries can adapt the research and use it as a guide in the development of competencies for their nursing staffs.
- 3) Researcher and academics can apply the data for the development of programs for the broader field of medical tourism.

Further research should be studied the education management model of competencies developed for service providers in the medical tourism industry, it may be arranged in non-formal education or may be one of the subjects in the curriculum of tourism or nursing. In order for the graduates to have the knowledge and skills to serve foreign tourists who come to receive treatment in Thailand.

## References

- Bumrungrad hospital. (2015). *Information about Medical Conditions*. Retrieved January 10, 2015 from <https://www.bumrungrad.com/en/diagnose-or-treat>
- Association of Southeast Asian nations. (2012). *Guide to Asean mutual recognition arrangement on tourism professionals*. n.d.: Association of Southeast Asian nations.
- Ghadar, F., & Loughran, K. (2014). Population trends: Shifting demographics", *Industrial Management*, 56(4), 26-30.
- Jaroenwisani, K. (2009). *Appropriate marketing model of venues for MICE industry in Thailand*. Unpublished doctoral dissertation, Maejo university, Chiangmai.

- Kotler, P., Hermawan, K., Den, H. H. (2015). *Think ASEAN! Rethinking Marketing toward ASEAN Community 2015*. Singapore: McGraw Hill Education.
- Kumpong. (2012). *Quality "private hospital" Thai fight it*. Bangkok: The private hospital association Thailand.
- NaRanong, A. (2011). Economic Crisis and Thailand Medical Hub. *NIDA Development Journal*, 51(1), 47-81.
- NaRanong, A., & NaRanong, V. (2011). The effects of medical tourism: Thailand's experience. *Bulletin of the World Health Organization*, 89(5), 336-344.
- Noree, T. t., Hanefeld, J., & Smith, R. (2016). Medical tourism in Thailand: a cross-sectional study. *Bulletin Of The World Health Organization*, 94(1), 30-36.
- Pasunon, P. (2010). *Business statistics*. Bangkok: Top.
- Pattamaroj, K. (2012). Thailand's competitiveness in logistics and supply chain in ASEAN. *Journal of business administration*, (Special edition on the occasion of the 73<sup>rd</sup> anniversary of founding the faculty of commerce and accountancy, Thammasat University), 79-99.
- Ruggeri, K., Záliš, L., Meurice, C. R., Hilton, I., Ly, T. L., Zupan, Z., & Hinrichs, S. (2015). Evidence on global medical travel. *Bulletin of the World Health Organization*, 93(11), 785-789.
- Ryu, E. (2011). Effects of skewness and kurtosis on normal-theory based maximum likelihood test statistic in multilevel structural equation modeling. *Behavior research methods*, 43(4), 1066-1074.
- Sahyoun, N. R., Lentzner, H., Hoyert, D. & Robinson, K. N. (2001). *Trends in causes of death among the elderly*. Maryland: National Center for Health Statistics.
- Saniotis, A. (2007). Changing ethics in medical practice: a Thai perspective. *Indian Journal of Medical Ethics*, 4(1), 24-25.
- Schwab, K. (2010). *The Global Competitiveness Report 2010–2011*, Switzerland: World Economic Forum.
- Sewasud, K. (2010). *A study of factors affecting access to medical services of foreign patients in private hospitals*. Bangkok: Faculty of Economics, Thammasat University.
- Smith, P. C., & Forgione, D. A. (2007). Global Outsourcing of Healthcare: A Medical Tourism Decision Model. *Journal Of Information Technology Case & Application Research (IvyLeague Publishing)*, 9(3), 19-30.
- Thailand Nursing and Midwifery Council. (2005). *Standard nursing care*. Nonthaburi: Thailand Nursing and Midwifery Council.