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CONTENTS

ENVALUATION OF SURVEILLANCE SYSTEM ON BLOOD STREAM INFECTION AT VIET NAM NATIONAL PEDIATRIC HOSPITAL, 2012 – 2017

Pham Thi Hong Nhung[1], Le Kien Ngai[1], Tran Minh Dien[1]

ABSTRACT

Background: Blood-stream infections (BSIs) are common nosocomial infections and have been one of leading causes of death in the world. Surveillance case of BSIs and practice of health care worker are very useful to prevent BSI.

Objective: To describe BSIs surveillance system and evaluate 6 attributes of BSI surveillance system (simplicity, flexibility, acceptability, timeliness, stability, data quality) of National Children Hospital according to guidelines of US's CDC.

Method: A quantitative study used in-depth interviews was implemented with 18 stakeholders working at Department of Infection control, Microbiology Department, Intensive Care Unit and leaders of the hospital. The recorded information was analyzed according to main variables of the study.

Results: BSIs surveillance system is an active system with simple one-way operative structure. The number of stakeholder is low and easy interactive. However, the case definition is complicated and isn't completely consistent. The advantage points of system are simplicity and high acceptance, the other 4 attributes were evaluated remaining fields to be strengthened. Case reports were frequently delayed resulting in loss of cases due to lack of specific procedures. In the first 9 months of 2016, it stopped operating because of manpower and software changes.

The system can adapt well to changes while maintaining the structure. The system have strengthen about Acceptability and simplicity. The case detection wasn't performed in a timely manner, which has led to late response and miss case. The system experienced a breakdown 9 months due to change of staff and of the hospital management software.

Conclusions: New standard case definition adopted by CDC in 2017 should be applied and the suitable operative procedures should be added for use for BSI surveillance system.

Keywords: Evaluation of surveillance system; blood stream infections; nosocomial infections.

I. INTRODUCTION

Blood-stream infection (BSI) is one of the most common types of hospital infections that cause treatment failures and increase mortality in intensive care units (1). The central line-associated BSI (CLABSI) is the infections with the highest incidence and mortality among all types of sepsis. Each year, in the US, about 80,000 BSI cases that are related to catheter placement among a total of 250,000 BSI cases and cause 2,400 - 20,000 deaths/year. The average cost for a case with BSIs is about USD 34,508 - USD 56,000 and the total cost can be up to 296 million - 2.3 billion USD/year

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(1). However, BSIs in general and the CLABSIs in particular can be prevented and controlled through strengthening the infection control compliance of health workers (3).

In Vietnam, currently there is no national BSI surveillance system. Data from studies show that the incidence of BSIs in intensive care units (ICUs) is about 9.6/1000 days of using central line. Hospitalization time was increased by 4 days compared to not BSI patients (5). The National Pediatric Hospital has started to build up a BSIs surveillance system since 2012 and maintained it up to now. However, the central line - associated BSI remains high (173 cases in the first 6 months of 2017), accounting for 30% of the total number of cases with hospital acquired infections (HAIs). Therefore, in order to conduct further improvement activities to reduce the incidence of BSIs and CLABSIs in the intensive care unit of the hospital, we conducted this evaluation to describe characters of structure and activity of BSI surveillance system of National Pediatric Hospital during period of 2012 – 2017 and to evaluate the 6 attributes (simplicity, flexibility, acceptance, timeliness, stability, data quality) of the system according the guidelines of US CDC.

II. METHODS

Study design: A quantitative study.

The study design was approved by the Ethical Committee of the National Hospital of Pediatrics and was conducted in March 2018.

Information collecting: In-depth interviews were conducted with 18 stakeholders of the surveillance system including: 01 hospital leader, 05 clinical department leaders, 01 infection control department leader, 02 staff of infection control department, 09 doctors and nurses of the hospital's infection control network of hospital ICU. Collected information included the system's operating structure, case definition, system indicators and system evaluation data according to the six attributes of the surveillance system following the "Guidelines for evaluating the monitoring system" of the US CDC (2).

Table 1. Definition of surveillance system attributes

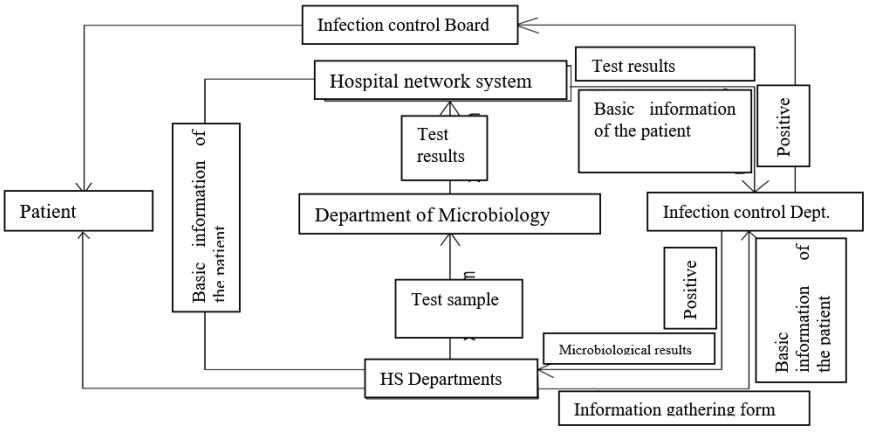
Attributes	Definition
The simplicity	Simple in structure, easy to operate and meets the objectives of the monitoring system.
The flexibility	Able to respond to the changes in information as needed or operate under limited time and resources. A flexible system can change the definition, technology, and reporting sources. Or have a data system that can integrate with many other systems.
Data quality	Reflecting the completeness and accuracy of data in the system
The acceptance	Reflecting the acceptability, readiness of participation of stakeholders to perform work in the system.
Timeliness	Reflecting the performing speed between steps in the system
The stability	Referring to the reliability of the system (the ability to collect data, manage, provide standard data) and availability (ready to operate when needed).

Data analysis: Decoded the tape, input the information according to main study topics and based on the research team's knowledge and experience to design the structural modeling, system operation and analysis of thematic problems. Excel 2013 software was used for data analysis.

III. RESULTS

Describe the surveillance system

Model 1: System organization chart and tasks of stakeholders



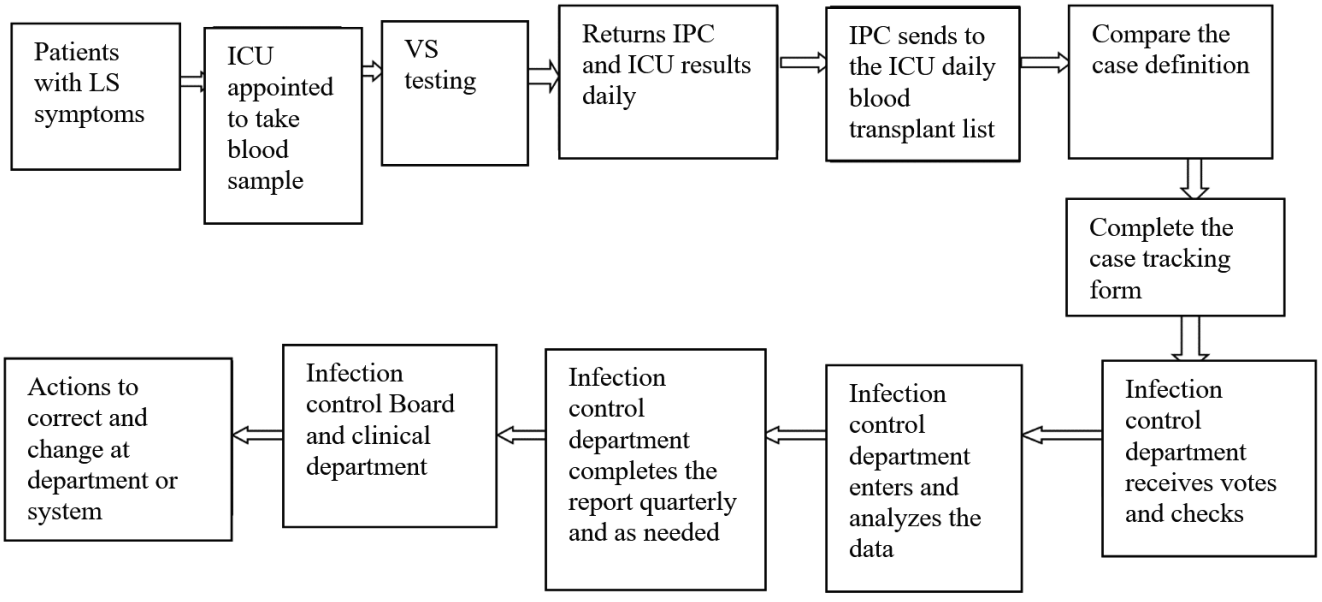
The system has a simple structure, predominated with one-way activities, indirect effects on patients.

Table 2. Case definition using for the system

BSI's diagnosis criteria	Suspective case	Confirmed case
Clinical case		
Children >1 y.o.	Includes: pale skin, chills, irritation... And at least 2 following symptoms: tachypnea, increased heart rate, or hypotension, prolonged vascular anuria, anuria (<0.5ml)	No infection at other sites; doctors diagnose and treat antibiotics in the direction of BSIs.
Children ≤1 y.o.	Includes: pale skin, chills, purple veins, rash, hemorrhage, scleroderma, increased or decreased muscle tone, irritation... And have at least 1 symptom: Fever or hypotension, apnea, slow heartbeat	
Subclinical case		
Microbiological		This agent is not related to another infection site
Opportunistic microbiological	Children > 1 y.o.: Fever >38^{0}C, chills, low blood pressure (at least one sign) Children ≤1 y.o.: Fever >38^{0}C, hypothermia <37^{0}C, apnea, bradycardia	- Have at least 2 blood cultures and have the same antibiotic testing results - Or 1 blood culture of a patient being treated with intravenous antibiotics - Or PCR (+) for the target agent

The system has been operating since 2012, but case definition was not issued by that time. The system is using blood test results (CPR, leukocytes, ...) and results of the microbiological examination reported on hospital data management software for final diagnosis of the case. The case definition has been issued from 2014, but it was not practically clear and complex for use. The clinical case was diagnosed in depending entirely on the clinician. For the case diagnosed based on laboratory positive blood culture, although few clinical criteria were needed, but it needs time to monitor the patient's progress to determine the case of BSIs. This revealed several difficulties for monitoring and collecting data.

Model 2: Diagram of the operating steps of BSI surveillance system



The operational procedure of the system was rather clear for apply, but functions and tasks for all related stakeholders need to be well defined and disseminated because currently, there is some confusions on function and task during the implementation process among the doctors and nurses participating in the infection control network of the system.

The properties of BSI surveillance system

Table 3. The strengths and weaknesses of BSI surveillance system

Properties	Strength	Weakness
The simplicity	- Simple 1-way structure - Few stakeholders, close geographical distance for easy interaction	- Lack of specific operational procedures - Case definition includes clinical based and laboratory-based diagnosis, inconsistent with the current structure and operation of the system.
The flexibility	- Adapting well to frequent changes in report content; - In 2016, the hospital transformed patient management software, and there was a shortage of system manpower in the first 9 months of the year. Problem was resolved by using handwriting and sharing information via zalo, Facebook among monitoring group.	- In 2014, using the definition of surveillance cases, there were both clinical and laboratory-based cases. After 6 months of implementation, most laboratory criteria were not used in case detection and no clinical cases were recorded. - Structurally, the system will be changed from the active surveillance by the Department of Infection control to passive surveillance, which requires a great active participation of the clinical department in collecting clinical cases.
Data quality	- Check the information on the case collection form and fill in any missing information before entering the data	- 5/5 Doctors responded that they identify cases based on clinical experience, rarely based on case definitions. - The staff of Infection Control Department responded that they did not recheck the case definition done by network doctor before entering data - Information on case reports performed by the Clinical Department is frequently missed (except the Neonatal Resuscitation Department). Due to a confusion of function among the related parties.
The acceptance	- The hospital's Board of Directors, the leaders of the stakeholders have strongly supported the establishment and maintenance, expect and commit to be ready to participate in system improvement activities.	- All members of the system accept the maintenance of the system, no comments for change and follow the direction of the leaders. - Doctors of infection control network is not really satisfied as this is a job that must be burdened with treatment, without any extra payment.

The timeliness	- The requirement for Infection control Department to send staff to collect patient's data is 3pm every day; case information must be returned at 10 am next morning, except weekends and holidays. - Timeline specified for the report: once a quarter, and the annual report	- This Department did not send case information daily - The Clinical Department often reports once a week. When asked why 100% answered because they were busy and some thought they were doing it just only for reporting, so not need to be done right away. - Loss of case happened due to patients transferring. - Slow response in preventive isolation - 100% of the respondents said that they should increase the frequency of reporting once a month
The stability		- Case information collection of the system mainly depends on the people - Staff did not received training, it is difficult to find a replacement to the system. In 2016, the system halted operation for 9 months because the hospital expanded and mobilized human resources to different positions, resulting in the shortage of human resource of the system, not replacements.

IV. DISCUSSION

The study focused on evaluation of BSIs surveillance system, but this evaluation result might be suitable for the whole hospital acquired infection surveillance system in general because of the similarity of these two systems concerning structure, operation and activity. The only difference is that the hospital acquired infection monitoring system considers more about other types of case definitions being used in the system such as pneumonia associated with mechanical ventilation, urinary tract infections.

System strengths and performance improvements

BSI surveillance system implemented at the National Pediatric Hospital, from the perspective of public health, is an active, one-way structured surveillance system as mentioned above. It's quite simple and suitable for case monitoring according to microbiological criteria. The second strong point is high acceptability, up to 100% from the stakeholders. Hospital and Department's leaders are not only ready to participate in the system's activities, but also expressed their willingness and ready to commit their participation, creating conditions to promote activities of the system. With the above strengths, the system improvement should be performed early at the Hospital.

Some improvements necessary for improve the surveillance system

The current case definition created for the system has almost not used in system operations due to a number of reasons, including not quite suitable for the operation of the system. However, the case standard definition is very important for a surveillance system, that helps to unify the classification, processing, and analysis of data from which to determine the outcome of the surveillance and the use of the monitoring results (9). Currently, the trend of monitoring cases based on microbiological evidence of HAI in general and of BSI in particular is being recommended and applied in many developed countries because of its clarity and simplicity than that used for clinical diagnosed cases (7, 9). With the structure and operation of the current system, the application of trend-based case definitions is perfectly appropriate.

At present, the system has developed its document system, including objectives, activities, support of stakeholders ... so the improvement of the system should start with the application of a new case monitoring definition according to international standards (3,4,9). The current system has no clear written regulations on monitoring: variables to collect, tasks of stakeholders, etc., leading to operational difficulties affecting data quality (loss of case, slow response). It is necessary to develop a monitoring process that is suitable to the actual situation with clear, well defined functions and tasks for the stakeholders to ensure the activity of the system. Training disseminates knowledge to all staff in the system and create abundant resources to ensure personnel readiness (stability) for the system in at situations of human disturbance (2). In particular, technologies should be applied to surveillance work; automated monitoring has been recommended to apply from many reputable international organizations and proved effective in many countries around the world (6,8). Finally, evaluation of surveillance system should be conducted regularly to find gaps to improve the quality of surveillance (2,9).

V. CONCLUSION

This is an active monitoring system, with a simple one-way operating structure, few stakeholders and easy interaction because all are working in the same hospital. The system expressed its simplicity and high acceptability. However, the used case definition was found unclear, quite complex and inconsistent with the operation of the system and international trends. The timeliness and quality of data were not match to the requirement, thus need to be targeted for improvement. The

stability and flexibility of the system were also not highly appreciated by the interviewees.

STUDY LIMITATION

The study has not check actual data for having specific quantitative information, nor evaluate criteria related to data quality and timeliness of the BSI monitoring system.

RECOMMENDATION

It is recommended to change the new case definition according to the 2017 CDC standard, and to build the operating procedures of the surveillance system based on standards and actual situation at the Hospital.

Training courses should be repeated annually to define cases, expanding to new participants in the system.

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CLINICAL CHARACTERISTICS, ULTRASOUND IMAGES AND ULTRASOUND-GUIDED FINE NEEDLE ASPIRATION CYTOLOGY RESULTS OF THYROID NODULES

Tran Thi Nhu Quynh[1], Chu Thi Giang[2], Nguyen Ngoc Trung[1], Pham Hoang Bich Ngoc[1], Nguyen Thi Thanh Huong[1], Nguyen Trung Nghia[1]

ABTRACT

The study was carried out in Ninh Binh General Hospital according to the method of cross-sectional descriptive study on 620 thyroid tumor patients. Research results showed that:

The average age of patients in the study group was 51.5 + 13.1 (year); Female patients were mainly 92.6%. Clinically common symptoms were self-detection of neck tumors 80.9%, neck pain 66%, difficulty in swallowing and choking 17.7%. The position of the right lobe thyroid nodule was 40.6%, the left lobe was 38.4%, both lobes were 16.9% and 1.5% was waist. Most patients had a soft density of thyroid gland nodule (95.9%).

Ultrasound results showed that the majority of patients were mononuclear tumors accounting for 65.6%. BNTG of subjects in ultrasound studies with size from 1 - 4 cm accounted for the highest rate of 67.6%, tumors <1 cm and tumors> 4 cm accounted for a small percentage. Patients with lesions in BNTG had mainly solid nodule (66.5%) and no signs of calcification on ultrasound (81.9%). Most goiters had clear boundaries (98.7%). And 100% of patients with follicular lesions on ultrasound all had clear follicles. On TIRADS ultrasound 1,2,3 accounted for 34.5%, 26.3% and 26.1% respectively; TIRADS 4.5 accounted for 10.8% and 2.3% respectively. There were no patient with TIRADS 6.

The results of cell aspiration with fine needles under ultrasound guidance (US-GFNA) had a malignant rate of 5.5%, suspected malignancy was 3.4% and benign rate was 91.1%.

Keywords: ultrasound images of thyroid, ultrasound-guides fine needle aspiration cytology of thyroid nodules.

I. INTRODUCTION

Thyroid nodule is a condition in which there is one or more nodules in the thyroid parenchyma, including both benign and malignant. This is a relatively common endocrine disease, accounting for about 4-7% of the population, most of which are benign, only about 4-5% are malignant.

Clinical manifestations of thyroid nodules are often limited, even without any symptoms at all. Therefore, the disease is often detected late when there is clear sign of core tumor. Noticeably, about 4% of thyroid nodules are cancerous and the clinical presentation is not much different from benign thyroid disease.

In recent years, thyroid nodule has a diverse morphology. Together with the strong development of science and technology, many advanced methods have been used to diagnose and treat thyroid nodules. Thyroid ultrasound plays an essential role in the diagnosis of thyroid

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nodules, even if the tumor size is smaller than 1cm. With the use of ultrasound in the diagnosis of thyroid diseases, the chance of detecting thyroid nodules by ultrasound increases about 10 times more than a clinical examination. Ultrasound helps identify mononuclear or multinuclear nodules, the size of the nucleus, the volume of the thyroid gland and the thyroid ultrasound also helps to distinguish between very low risk thyroid follicles and dense, mixed nuclei that have a higher risk of thyroid cancer. Ultrasound is a reliable tool in the diagnosis of metropathic tumors and helps to detect changes in glandular structure at early stage. Therefore, many authors such as Le Hong Cuc and Breslin suggested that ultrasound should be used as a mean of screening for thyroid nodules. [6].

Fine-needle aspiration biopsy is an easy-to-perform, low-invasive technique with high diagnostic value because it can provide direct and specific information about a thyroid nodule. According to AACE, this is a method that is "believed to be the most effective in distinguishing between benign thyroid nodules and cancerous nodules" with an accuracy of up to 95% if it is performed professionally by experienced technicians and qualified readers. Fine-needle aspiration under the guidance of ultrasound have a higher success rate, especially those under 1cm, the nodules located at the back, mixed nodules with a solid fluid component. In the case of polyps, ultrasound helps determine which nodules need aspiration [6].

In clinical practice, it is necessary to diagnose thyroid nodules accurately that are benign or malignant in order to determine appropriate treatment. Ultrasound is used to support and guide cell aspiration, avoiding the situation of either malignant injury or abuse of surgical removal of the thyroid gland, requiring lifelong thyroid hormone treatment.

In order to contribute to a better understanding of the clinical characteristics, images of ultrasound of the thyroid gland, especially the results of cell aspiration with fine needles under ultrasound guidance to distinguish malignant thyroid nodules from benign thyroid nodules. We conducted the study with the aim was to "describe clinical characteristics, ultrasound images and ultrasound-guided fine needle aspiration cytology results of thyroid nodules at Ninh Binh General Hospital".

II. OBJECTIVES AND METHODOLOGY

Objectives:

All patients who were examined and treated at the Department of Endocrinology - Ninh Binh General Hospital were diagnosed with thyroid tumor between January 2018 and August 2018.

Methodology:

Cross-sectional descriptive study

Sample size*:*

Convenience sampling method: 620 thyroid tumor patients were eligible to recruit from January 2018 to August 2018.

Data analysis:

The collected data were entered and analyzed using SPSS 16.0 software. Data was presented in the form of tables and charts with interpretation and discussion.

Ethics:

The study followed code of ethic in research.

III. RESULTS AND DISCUSSIONS

The study on 620 thyroid tumor patients who were diagnosed by ultrasound-guided fine needle aspiration cytology showed an average age of 51.5 ± 13.1; the youngest age was 7 years old, the highest was 95 years old, of which women accounted for 92.6%; male was 7.4%; female / male ratio = 12/1.

3.1. Clinical characteristics of thyroid tumor patients

Table 3.1. The prevalence of common symptoms in thyroid tumor patients

Functional symptoms	n	%
Self-detection of neck tumors	502	80,9
Neck pain	409	66
Difficulty in swallowing and choking	110	17,7
Speak hoarsely	69	11,1
Lymph nodes	16	2,5
Pain	6	0,9
No symptoms	9	1,5

Most of the goiters were self-detected by symptoms of neck tumors with the rate up to 80.9%, 66% was severe at neck area, 17% of difficulty in swallowing and choking. However, 1.5% of cases was without clinical symptoms, accidentally discovered by ultrasound during regular health examination. Other clinical symptoms of goiter are very poor, accounting for a very low percentage such as hoarseness 11.1%, neck lymph nodes (2.5%), pain (0.9%), shortness of breath (0,9%). A new hoarse symptom may be due to the tumor invading the laryngeal nerve. Difficulty in swallowing or neck pain can point to a malignant tumor, although the same symptoms may also occur in benign tumors. The distribution of samples depended on the reasons of having health check in our study was similar to those of other authors such as Ta Van Binh and Nguyen Thi Hoa Hong [1], [2].

Table 3.2. Clinical characteristics of thyroid nodules

Characteristics		n	%
Position	Right lobe	252	40,6
	Left lobe	238	38,4
	Waist	16	2,6
	Both lobes	105	16,9
	Not any	9	1,5
Total		**620**	**100**
Density	Soft	586	95.9
	Solid	25	4,1
Total		**611**	**100**
Boundary	Clear	601	98,4
	Unclear	10	1,6

Total		**611**	**100**
Grade	IA	79	12,9
	IB	92	15,1
	II	212	34,7
	III	228	37,3
Total		**611**	**100**
Mobility	Rhythmic swallow	619	99,8
	Non run swallow	1	1,2
Total		**620**	**100**
Skin infiltration	Non infiltration	620	100
	Infiltration	0	0
Total		**620**	**100**

The most common position was at the right lobe 252 nodules (40.6%), left lobe 238 nodules (38.4%), both lobes 105 nodules (16.9%), waist 9 nodules (1.5%).

Most clinical goiters were grade II and III, accounting for 72%. The majority of clinical goiters had a soft density (95.9%), a clear boundary (98.4%), and a mobility with rhythmic swallowing (99.8%). No cases showed signs of skin infiltration.

Our results were consistent with other studies including Lam Van Hoang and Vu Thi Bich Nga's studies which also showed that there was no difference in the incidence of thyroid cancer between the right and the left lobe [3], [4].

Table 3.3. Clinical characteristics of lymph nodes

Characteristics of neck lymph nodes		**n**	**%**
Neck lymph nodes	Yes	16	2,6
	No	604	97,4
Characteristics	Solid	2	12,5
	Soft	14	87,5
Mobility	Limited mobility	2	12,5
	Normal mobility	14	87,5

The majority of patients without clinical lymph nodes accounted for 97.4%. There were 16 patients with neck lymph nodes accounting for 2.6%. Among patients with clinical lymph node symptom, most of the nodes were soft and mobile (87.5%). There were 2 patients with neck lymphadenopathy, limited mobility, accounting for 12.5%. According to Nguyen Thi Hoa Hong,

the rate of clinical lymph nodes detection was 5.4% and all these patients had post-operation results of thyroid cancer, lymph node metastases [2].

3.2. Ultrasound results

Table 3.4. Ultrasound characteristics of thyroid nodules

Characteristics		n	%
Type of nodule	Solitary thyroid nodule	407	65,6
	Multinodular goiter	213	34,4
Total		**620**	**100**
Size	< 1 cm	180	29,0
	1- 4 cm	419	67,6
	> 4 cm	21	3,4
Total		**620**	**100**
Shape	Vertical > Horizontal	34	5,5
	Vertical ≤ Horizontal	586	94,5
Total		**620**	**100**
Structure	Solid	412	66,5
	Cyst	59	9,5
	Complex	149	24
Total		**620**	**100**
Echogenicity of solid nodule	Hypoechoic	286	46,1
	Anechoic	111	26,9
	Hyperechoic	15	3,6
Total		**412**	**100**
Calcification	Micro-calcification	35	5,2
	Macro-calcification	77	12,4
	Absent	508	81,9
Total		**620**	**100**
Boundary	Unclear boundary	8	1,3
	Clear boundary	612	98,7
Total		**620**	**100**
Regional lymphadenopathy	No	604	97,4
	Yes	16	2,6
Total		**620**	**100**

Solitary thyroid nodules accounted for 65.6% while multinodular goiters covered the rest of 34,4%. A big number of goiters had size ranges from 1 to 4 cm (67.6%). On ultrasound, most goiters had vertical shape which was smaller than horizontal shape (94,5%); clear boundary (98,7%) and non-calcification (81,9%)

Our result was similar to other studies of Tạ Văn Bình, Nguyễn Hoa Thu Hồng, Lâm Văn Hoàng, Trần Văn Tuấn, Nguyễn Khoa Diệu Vân, Trịnh Văn Tuấn [1], [2], [3], [5].

Table 3.5 TIRADS grade by ultrasound

TIRADS Grade	n	%
TIRADS1	214	34,5
TIRADS2	163	26,3
TIRADS 3	162	26,1
TIRADS 4	67	10,8
TIRADS 5	14	2,3
Total	**620**	**100**

On ultrasound, TIARDS (1), (2), (3) accounted for 86,9%. TIRADS (4), (5) accounted for 13,1%. In which TIRADS 1,2,3 accounted for 34,5%, 26,3% and 26,1%; TIRADS 4.5 accounted for 10.8% and 2.3% respectively. There was no patient with TIRADS 6.

Our result was similar to other studies of other authors [7], [8].

3.3. Ultrasound-guides fine needle aspiration cytology of thyroid nodules

Table 3.6. Results of aspiration cytology of thyroid nodules by US-FNA

Results of aspiration cytology	n	%
Malignant	34	5,5
Suspected malignancy	21	3,4
Benign	565	91,1
Total	**620**	**100**

The rate of malignancy by fine needle aspiration in our study was 5.5%, the rate of suspected malignancy was 3.4%, the rate of benign was 91.1%. The results of ultrasound-guides fine needle aspiration cytology of thyroid nodules in our study were consistent with those of other authors. The study by Nguyen Thi Hoa Hong found that fine needle aspiration showed 60% benign, 5.5% malignant, and 5.4% suspected malignancy [2]. The study of the author Vu Bich Nga conducted on 339 thyroid nodule patients with ultrasound-guides fine needle aspiration cytology showed that the rate of benign goiter was 90.6% and thyroid cancer was 9.4% [4]

V. CONCLUSION

Study on 620 thyroid tumor patients by fine-

needle aspiration under ultrasound guidance at Ninh Binh General Hospital, we found that the clinical symptoms were few. Most of the goiters were self-detected by symptoms of neck tumors with the rate up to 80.9%, 66% was severe at neck area. Other clinical symptoms of goiter were fewer, 17% of difficulty in swallowing and choking, 11.1%, and 1.5% without symptoms.

Thyroid ultrasound is an imaging test that helps diagnose thyroid nodules accurately, is routinely prescribed clinically and detect clinically palpable nuclei. The majority of cases were solitary thyroid nodules (65.6%); with size of 1 - 4 cm (67.6%); lesions in the thyroid nodules were mainly solid (66.5%) and showed no sign of calcification on ultrasound (81.9%); Thyroid nodules had a clear boundary (98.7%) and 100% of patients with cystic lesions on ultrasound having clear cyst margins. On ultrasound, there were mainly TIARDS (1), (2), (3), accounting for 86.9%. TIRADS (4), (5) accounted for 13.1%. There was no patient with TIRADS 6.

The results of cell aspiration with fine needles under ultrasound guidance (US-GFNA) had a malignant rate of 5.5%, suspected malignancy was 3.4% and benign rate was 91.1%.

In conclusion, in addition to the determination of morphological characteristics of thyroid goiter, ultrasound also assists doctors in the process of cell aspiration with fine needles to diagnose early and accurately, contributing to the decision of providing the most optimal treatment for the patients.

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DISEASE STRUCTURE OF PATIENTS AT SAIGON GENERAL HOSPITAL IN HCM CITY, 2016-2018

Nguyen To Bao Hoang[1], Duong Dinh Cong[2]

ABSTRACT:

Introduction: Disease structure demonstrates the ability to meet and use healthcare services at hospitals. In order to have characteristics of a disease model, all detailed and comprehensive information must be collected from a variety of subjects by gender, age and treatment. The study aimed to identify characteristics of disease models at Saigon General Hospital in Ho Chi Minh City for the period of 2016-2018.

Objectives: Identify the disease structure of inpatients and outpatients admitted to Saigon General Hospital from 2016 to 2018.

Methods and subjects: Retrospection of medical records, cross-sectional study. All inpatients and outpatients at Saigon General Hospital, Ho Chi Minh City from 2016 to 2018.

Results: During the period from 2016-2018 Saigon General Hospital examined a total of 44,406 patients with a total of 26,037 visits. Among them, the majority was female (56.46%), mainly in the age group of 15-59 years old. In 21 chapters of ICD10, 74.91% of diagnoses belonged to 6 chapters, including 4 chapters of internal diseases such as circulatory system (Chapter 9), respiratory system (Chapter 10), musculoskeletal (Chapter13) with the highest proportion, followed by endocrine (Chapter 4) and digestive system (Chapter 11).

The most common diseases in adults were idiopathic hypertension, non-insulin dependent diabetes. On the other hand, the common diseases in children were acute pharyngitis, acute sinusitis.

Conclusion: The research results are important information serving as a basis for monitoring in order to meet customers' needs, as well as rationale for the development of specialties appropriate with the location and specific conditions of the hospital.

Key words: Disease model, ICD10, most common diseases, Ho Chi Minh city.

I. INTRODUCTION

Disease structure is the structure of diseases, the primary arrangement according to the proportion of types and groups of human diseases in a community [1], [2], [3]. According to "Global Burden of Disease" report of the World Health Organization (WHO), more than 60% of the health burden was caused by non-communicable diseases (NCDs); 28% of infectious diseases and other diseases related to mothers, infants and nutrition; and more than 10% due to trauma at a global level in 2016.

In 2010, Vo Van Ty *et. al* conducted a study at Thong Nhat Hospital, whose results showed that the overall death rate was 0.67%, the Department of ICU-Emergency had the highest death rate which was 28.79%. Diseases of the respiratory system, circulatory system, neoplasms, endocrinology were the leading causes of deaths [4]. In 2017, Nguyen Thi Thu Nga conducted a study at District

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7 Hospital in Ho Chi Minh City, showing the ten most common disease groups: hypertension, diabetes, acute nasopharyngitis, duodenitis-gastritis, neurodermatitis and plexus, disorder of vestibular function, Dengue hemorrhagic fever, acute pharyngitis, digestive disorders, chronic ischemic heart disease [5]. In 2016, the Ministry of Health of Malaysia listed the ten most popular types of diseases to be examined and treated: Pregnancy, childbirth and puerperium 23.07%; Diseases of the respiratory system 12.80%; Infectious and parasitic diseases 8.74%; Certain conditions originating in the perinatal period 8.67%; Injury, poisoning 7.66%; Diseases of the circulatory system 7.50%; Diseases of the digestive system 4.58%; Diseases of the genitourinary system 4.29%; Neoplasms 4.17%; Factors influencing health status 3.24% [6]. The above results proved that disease structure is an important factor to formulate a plan of disease prevention and health improvement for the community and local people. Therefore, we conducted this study aiming to identifying the disease structure of inpatients and outpatients at Saigon General Hospital from 2016 to 2018.

II. MATERIALS AND METHODS

2.1. Study subjects, location, period:

- Study subjects: All medical records of patient receiving inpatient and outpatient treatment at Saigon General Hospital, Ho Chi Minh City for three years (2016, 2017, 2018).

- Location, period of time: Medical records were collected from 2016 to 2017 at Saigon General Hospital in Ho Chi Minh City.

2.2. Methods:

- Study design: Retrospection of medical records, cross-sectional study.

- Sample size and criteria for sample selection: All 264,037 medical records of 44,406 patients (excluding duplication examinations and treatments of same patient) receiving inpatient and outpatient treatment City for three years (2016, 2017, 2018).

- Criteria selection: All medical records of patient receiving inpatient and outpatient treatment at Saigon General Hospital, Ho Chi Minh City for three years with all types of diseases, deaths classified according to ICD 10.

- Criteria for exclusion: Patient medical records at Saigon General Hospital, Ho Chi Minh City lack of information.

2.3. Main steps:

- Select medical records meeting criteria for subject enrollment.

- Export data base on variations in information collection form.

- Entry data in Excel software.

2.4. List and definitions of research variations

1. Characteristics of study subjects: age, sex, occupation, resident address.

2. Medical examination and treatment: Number of medical examinations for each year and for all 3 years, average number of medical examinations, number of medical examinations and rate of medical examination distributed by department

3. Disease structure according to ICD10: Disease structure according to 21 chapters of all 3 years, structure of 5 common disease groups by chapters for 3 years, structure of 10 common disease groups each year and in all 3 years.

4. Actions taken by years and departments: Death cases by years and by departments.

2.5. Data analysis

Data were entered and analyzed using biostatistical methods. Stata version 14.0, Excel software were employed. P value was set less than 0.05.

2.6. Ethics in research

This study was approved by Science Committee of Pham Ngoc Thach Medical

University. The rights and personal information of all subjects were protected in accordance with the Committee's regulations.

III. RESULTS

3.1. General information

Table 3.1. Distribution of age groups by year

Year	<15 years old	From 15 to 59 years old	≥ 60 years old
2016	462	38331	18535
2017	767	66903	37670
2018	900	62493	37976
Total	2129	167727	94181

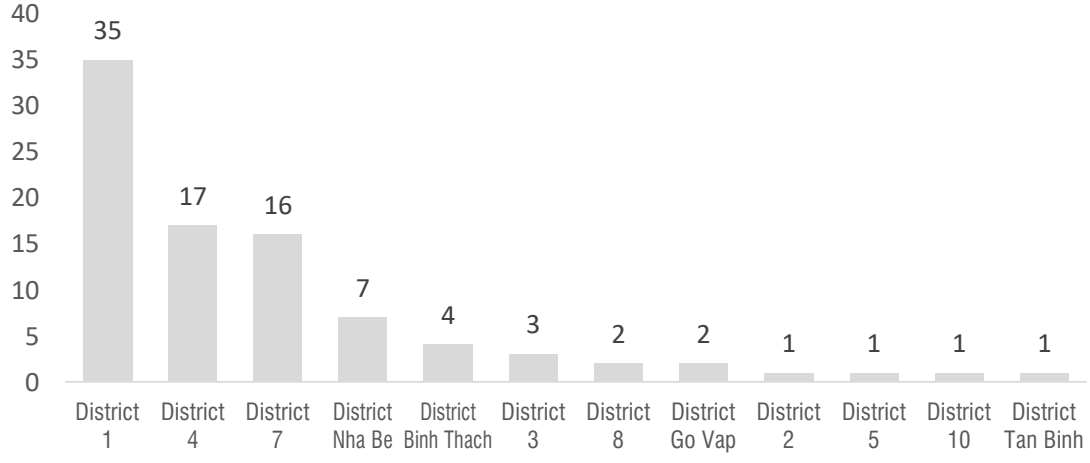
Study revealed that the number of patients belonging to working age (from 15 to 59) kept stable and accounted for the highest proportion, while the age less than 15 was very low.

Table 3.2. Distribution of sex by year

Year	Female (n, %)	Male (n, %)	Total (n, %)
2016	32496(56,69)	24832(43,31)	57328(100,0)
2017	59134(56,14)	46206(43,86)	105340(100,0)
2018	57442(56,67)	43927(43,33)	101369(100,0)
Total	149072(56,46)	114965(43,54)	264,037(100,0)

Results showed that the number of female patients accounted for a higher proportion than that of men for 3 years.

Figure 3.1. Distribution of patients by districts in HCM city



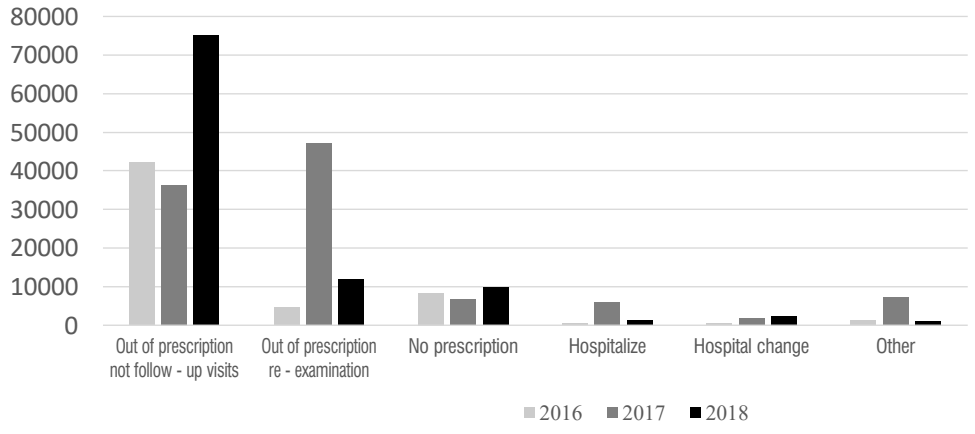
In 3 years, most patients who went to Saigon Hospital (3/4) were from nearby districts such as District 1, 4, 7 and Nha Be, and the remaining (1/4) was from many other districts. Patients mainly visited Internal Medicine Department with the highest number of medical examinations, accounting for 1/3 of the total number of hospital visits. Another 1/3 belonged to the Departments of Otolaryngology, Orthopedic Trauma and Gerontology. The rest belonged to Specialty Departments, of which Department of On-demand Examination was defined as a combination of all specialties mostly related to Internal Examination.

Table 3.3. Number of diagnostics according to 21 chapters of ICD10

ICD Chapter	No. of diagnostics	%
Chapter 01: Certain infectious and parasitic diseases	11137	4.22
Chapter 02: Neoplasms	3425	1.30
Chapter 03: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	295	0.11
Chapter 04: Endocrine, nutritional and metabolic diseases	31577	11.96
Chapter 05: Mental and behavioural disorders	829	0.31
Chapter 06: Diseases of the nervous system	2701	1.02
Chapter 07: Diseases of the eye and adnexa	13593	5.15
Chapter 08: Diseases of the ear and mastoid process	7397	2.80
Chapter 09: Diseases of the circulatory system	54670	20.71
Chapter 10: Diseases of the respiratory system	40329	15.27
Chapter 11: Diseases of the digestive system	23165	8.77
Chapter 12: Diseases of the skin and subcutaneous tissue	11687	4.43
Chapter 13: Diseases of the musculoskeletal system and connective tissue	34446	13.05
Chapter 14: Diseases of the genitourinary system	7471	2.83
Chapter 15: Pregnancy, childbirth and the puerperium	67	0.03
Chapter 16: Certain conditions originating in the perinatal period	9	0.00
Chapter 17: Congenital malformations, deformations and chromosomal abnormalities	96	0.04
Chapter 18: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	5702	2.16
Chapter 19: Injury, poisoning and certain other consequences of external causes	10184	3.86
Chapter 20: External causes of morbidity and mortality	71	0.03
Chapter 21: Factors influencing health status and contact with health services	5186	1.96

The study showed that in 21 chapters of ICD10, 90% of the diagnoses were classified into 10 following chapters: 9, 10, 13, 04, 11, 07, 12, 01, 19, 14, of which 74.91% of the diagnoses belonged to 6 chapters including 4 chapters of internal medicine such as circulatory system (Chapter 9), respiratory system (Chapter 10), musculoskeletal system (Chapter 13) accounting for the highest proportion, followed by endocrine (Chapter 4), digestive system (Chapter 11). Among those, non-insulin-dependent diabetes, spinal degeneration, gastritis and duodenum had gradually increased in 2018. The research results showed that among the most used diagnoses of each year, chronic diseases accounted for the highest proportion (e.g. idiopathic hypertension, insulin-independent diabetes). On the other hand, groups of infectious diseases were often low and stable in 3 years of the study.

Figure 3.2. Distribution of actions taken by visits and years



The number of patients who were prescribed for out-patient treatment accounted for the highest proportion of more than 80%. The rates of other treatment types by visit for each year are relatively similar across all years.

Table 3.4. Number of deaths by departments

	2016	2017	2018
ICU - Emergency	7(36.84)	7(36.84)	5(26.32)
General emergency	17(20.00)	34(40.00)	34(40.00)
Outpatient emergency	0(0.00)	10(25.00)	30(75.00)

In the hospital, except for the Department of General Emergency, the Department of ICU - Emergency had a team for outpatient emergency. This team specializes in performing first aid and emergency transportation. The number of deaths reported from outpatient emergency increased rapidly in 2017 and 2018.

IV. DISCUSSIONS

Among 50,813 patients, studies described that the proportion of female patients was higher than that of male patients (56.46%). This finding was similar to that of Nguyen Thi Thu Nga's study on "Disease structure of patients coming for medical examination and treatment at District 7 Hospital

in Ho Chi Minh City", which showed the ratio of female was 55% and male was 45% [5]. Dang Minh Hai at Pleiku Traditional Medicine Hospital also published that female ratio was 53.3% and male was 46.7% [7]. The age group was mainly in the working age group from 15 to 59 years old. Our research results were similar to those at Phuc Yen Regional General Hospital with the age group of 16-49 years old ranking first (48.6%), the 60-70 years old group accounted for 11.7% etc. [8]. In 3 years, most of patients went to the hospital from Ho Chi Minh City (92%), mainly from the District 1,4,7 and Nha Be.

The proportion of medical examinations at the hospital increased each year in which three internal departments: Internal Medicine, General Internal Medicine - Endocrinology, and Internal Medicine and Respiratory should have the highest number of visits due to the incidence of hypertension and diabetes. The highest percentage of patients with diabetes were removed.

In 21 chapters of ICD10, 26,037 diagnoses were recorded, nearly third quarter of diagnoses (74.91%) belonged to 6 chapters, including 4 chapters of internal diseases such as circulatory system (Chapter 9), respiratory system (Chapter 10), endocrine (Chapter 4) and digestive system (Chapter 11) accounted for high proportions, followed by 2 surgical chapters such as musculoskeletal (Chapter 13) and injury (Chapter 19). Similar results were found in Nguyen Thi Thu Nga's study at District 7 Hospital in Ho Chi Minh City showing that the four above-mentioned disease groups also had the highest rates of diagnoses and were also corresponding in the order of each group [5]. Vo Van Ty and Tran Manh Hung's study at Thong Nhat Hospital in 2010 also identified the above four chapters with the highest number of diagnoses [4].

The hospital's taken actions focused on prescribing for out-patient treatment, i.e. treatment for acute, mild cases. From 2016-2018, there were 144 death cases primarily from the Department of General Emergency.

V. CONCLUSIONS

The research results were important information serving as a basis for monitoring and evaluating the disease structures at Saigon General Hospital and suggesting recommendations in improving the quality of medical examination and treatment for current and future patients. There is a need to continue training health workers to improve their skills and organize health education campaigns to improve people's awareness of chronic diseases.

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CURRENT PERSONNEL SITUATION OF EMERGENCY PEDIATRIC TRANSPORTATION SERVICE FROM PROVINCIAL HOSPITALS TO THE NATIONAL PEDIATRIC HOSPITAL IN 2013

Le Thanh Hai[1], Le Ba Tuan[1], Do Manh Hung[1]

SUMMARY

Emergency transportation services that have sufficient number of medical personnel with qualifications and skills play an important and essential role in the emergency transportation process. In order to understand the current situation and find solutions to build human resources in the pediatric emergency referral, a cross-sectional descriptive study was conducted on 410 pediatric cases that were emergency transported from provincial hospitals to the National Pediatric Hospital in 2013.

The results showed that the participation of 1 staff in patient transportation was accounted for 65.1%, of 2 persons was 34.9%. 3.2% of cases were transferred by the team made of 1doctor and 1 midwife; 31.7% cases were with 2 nurses; the rest was with 1 nurse (65.1%). 13.7% of provincial hospitals have established their Emergency Transport Team (ETT) with the regularly participation of 26.1% health workers. Among these, 9% were experienced staff; 47.3% were trained with advanced pediatric emergency (APLS); 46.3% were evaluated to achieve the emergency skills assessment.

Keywords: Health workers; emergency patient transportation; provincial hospital.

I. INTRODUCTION

1. National Pediatric Hospital

According to Jons Hopkins Medicine, it is required that staff participating in patient transportation need to be trained through basic training courses such as Advanced Pediatric Life Support (PALS), Emergency Nursing Pediatric Care (ENPC), Advanced Trauma Care for Nurses (ATCN). When transporting a newborn patient, there must be a separate transportation crew [7]. There are many complex and varied diseases that medical care facilities cannot afford to deliver intensive care and treatment [6]. Therefore, patients need to be transferred to a higher level based on the principle that patients receive the best care from the initial reception and management health facility to higher level units.

According to Le Thanh Hai [1], the fact that the provincial general hospitals do not have an emergency patient transport team with specialized health workers leads to the situation that medical staff transporting patients do not know enough about patients from name, age, diagnosis, treatment, as well as inability to monitor, evaluate and handle emergencies occurring during transportation, resulting in the patient's condition worsening or deaths on transit.

Pediatric patients with emergency referral are often serious illnesses, at provincial hospital they might unable to have sufficient qualifications and technical condition for treatment and must be taken to the National Pediatric Hospital. In order to

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understand the current situation of human resources among emergency pediatric transportation service, we conduct this research, thereby proposing solutions in building an effective emergency transport team for reduce unsafe emergency transport rates.

II. STUDY METHODS

2.1. Study subject

Medical staff of emergency transportation teams for children with severe illness aged 0-18 years that were emergently transported from a provincial hospital or equivalent to a National Pediatric Hospital in accordance with the regulations of the Ministry of Health.

2.2. Time and study location

Duration of research: from May 2013 to December 2013

Research location: Emergency Department, Anti-Toxic Department, Emergency room at National Pediatric Hospital.

2.3. Research design: Descriptive cross section with analysis, quantitative research

2.4. Study sample size:

Choose a random sample according to the formula:

$$n = \frac{Z^2_{(1-\alpha/2)} p(1-p) * N}{d^2 (N-1) + Z^2_{(1-\alpha/2)} p(1-p)}$$

N = 9.500: The size of study subjects. This study was conducted from March 2013 to December 2013, so we used numbers of emergency hospital transfers of the same period in 2012, i.e. from May to November 2012. A total of 9,500 patients were emergency transported from provincial hospitals to the National Pediatric Hospital.

p = 27.8%=0.278 is the unsafe transfer rate, refer to a study on emergency transporting services from provincial hospitals to Children's Hospital Number II (Central hospital in Ho Chi Minh city) conducted from March 2003 to February 2004 by Hoang Trong Kim et al [3].

Z = 1.96 (α = 0.05, 95% confidence, extracted from table Z)

d = 0.045, the absolute error, taking the level of 0.045

n = 367 was conculcated as the minimum required number, add 10% of ensure the precaution, 405 children cases need to be collected for research.

In fact, for this study, 410 children that were emergency transferred from provincial hospitals and other hospitals of equivalent level to National Pediatric Hospital were collected.

2.5. Data processing and analysis

Data entry was processed by EPIDAT software, data analysis done by SPSS software.

III. RESULTS

Table 1. General information of staff involved in emergency transport service

Factor		Number	Rate %
Number of health staff on the transport vehicle	1 staff	267	65.1
	2 staff	143	34.9
Staff title	Doctor and midwife	13	3.2
	2 nurses	130	31.7
	1 nurse	267	65.1
The hospital has emergency transport team	Yes	56	13.7
	No	354	86.3
Staff involved in emergency transport regularly	Yes	107	26.1
	No	303	73.9
Staff experienced with working at Emergency department	Yes	37	9.0
	No	373	91.0
Staff trained with APLS	Yes	194	47.3
	No	216	52.7
TỔNG		**410**	**100**

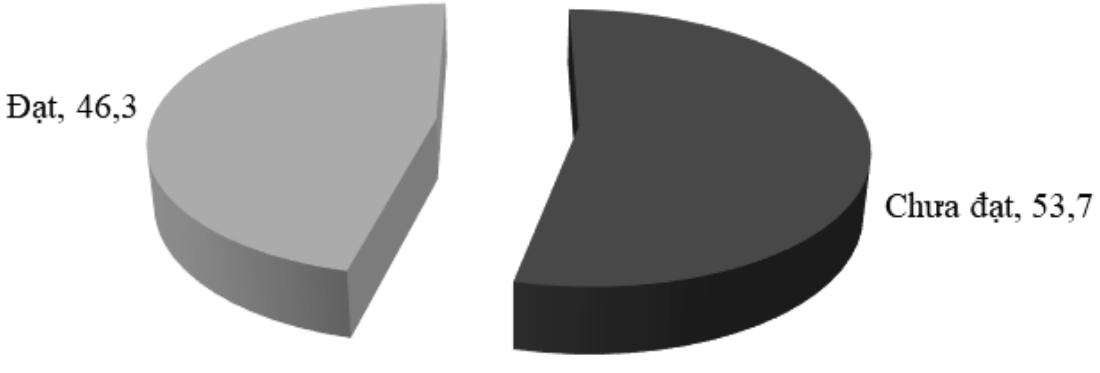
The transportation of emergency children patients mostly performed by 1 medical staff with nursing qualifications (65.1%), the rest was accompanied with 2 staff (34.9%). Only about 3.2% of cases was transported by 1 doctor and 1 midwife. At provincial level, only 13.7% of hospitals having their emergency transport team. The rate of staff that regularly participated in emergency transportation was 26.1% and only 9% of emergency transporting team showed having experience in performing emergency jobs at the emergency department. The percentage of staff that was trained on APLS is 52.7%.

Table 2. The emergency skills among emergency transport teams

Factors		Number	Rate (%)
Skill to monitor and evaluate heavy signs	Yes	267	65.1
	No	143	34.9
Skill to squeeze Masque ball	Yes	151	36.8
	No	259	63.2
Skill to insert endotracheal	Yes	36	8.8
	No	374	91.2
Skill to perform intravenous infusions	Yes	154	37.6
	No	256	62.4
Skills to manage convulsions	Yes	138	33.7
	No	272	66.3
Heart resuscitation skills	Yes	99	24.1
	No	311	75.9
TOTAL		**410**	**100**

Result of emergency care skill assessment of staff involved in emergency transport team showed 34.9% do not have the skills to monitor and evaluate severe signs; 63.2% had no skill to squeeze Masque ball; 91.2% had no intubation skills; 62.4% of teams did not have the skills to put intravenous line; 66.3% of the staff had no skills to manage convulsion and 75.9% had no cardiopulmonary resuscitation skills.

Figure 1. Rate of staff having emergency skills achieved requirement



There were 220 emergency transporting staff who did not reach the emergency skill points (53.7%) among the assessed staff.

IV. DISCUSSION

In this study, human resources for emergency care service, if not counting the driver, is the majority of nurses (65.1%). The emergency transporting team that composed of 2 medical staff was accounted 34.9%, of which the team that composed of 1 doctor and 1 midwife was organized only for 3.2% of cases and the team made of 2 nurses were 31.7%. According to the report on the proposal to build a pediatric emergency system (2004) by Dinh Phuong Hoa, the staff for each emergency ambulance must be at least 03 people, including 1 doctor trained in pediatric emergency, 01 pediatric nursing nurse, 01 driver [2]. Warren et al. (2004) recommend that the number of patient transport team must be at least two, especially when transporting severe patients, a trained physician for handling respiratory and cardiovascular situations is required. For the not severe disease -patients, the nurses can be appointed [8], [9].

Our obtained results are similar to that reported by Le Thanh Hai et al. [1] when they conducted 2 studies on referral of severe patients from 25 provincial pediatric hospitals and general hospitals to National Pediatric Hospital at phase I in November 2007 - March 2008 and phase 2 in August 2009 - January 2010. Their results showed 90% pediatric emergency transports was conducted with 1 medical staff (excluding drivers), of which 81% were nurses, 9.3% were midwives and only 5.8% were doctors.

Our research results showed that the proportion of provincial hospitals having their emergency transport teams was only 13.7%, most hospitals do not have this service. This result is consistent with the results obtained by Le Thanh Hai et al. [1] in 2007-2010, of which, except for emergency care 115 which has its separate transport staff, the rest do not have a full-time staff responsible for emergency transporting. Most of health staff that transporting patients were nurses, either working in the department where the patient is transferred, in pediatric ward or in other departments of the hospital.

In fact, the provincial hospitals that do not have an emergency patient transport team with specialized health workers lead to the situation where medical staff transporting patients does not fully know the patient's name, age, their diagnosis, treatment, and inability to monitor, evaluate and handle emergencies that occur during transportation, resulting in a patient's condition worsening or deaths on transportation.

Usually staff with experience and regular works on emergencies is practicing better in several emergency situation. Our results showed low rate of staff involved in regularly emergency transport (26.1%), only 9% of them have experience of working in the emergency department. The percentage of staff educated on APLS accounted only for 47.3%. According to study done by Le Thanh Hai et al. [1], the emergency skills among the staff that not trained on APLS was very low with 80% unsatisfactory, 9% qualified.

The results of our assessment of the emergency care practicing skills among medical staff involved in transportation of 410 pediatric cases in this study showed that the rate of staff having the skill of monitoring and evaluating severe signs was 65.1%, the rate of having Masque ball squeezing skill was 36.8%, the rate of having intubation skills was only 8.8%, the rate of those skilled with putting intravenous line was 37.6%, the rate of those having skills to manage seizures was 33.7%, and the rate of those that having cardiovascular resuscitation skills was

24.1%. The obtained results also show that there were 220 emergency transport teams (53.7%) having staff that did not meet the emergency skill. This rate is much lower than that obtained by Le Thanh Hai et al. from two studies conducted in November 2007 to March 2008 (first phase), and from August 2009 to January 1, 2010 (second phase). The results showed that the rate of staff having skills on emergency transport in the first round of monitoring was 81.9% and raised up to 90.3% at second phase of evaluation; rate of staff with skill on intravenous infusion was accounted 79.6% in the 1st monitoring round and 66.1% in the second round; rate of those having skill of squeezing ball in the first monitoring round was 75.2%, and 77.1% in the second round; rate of those with skills to perform cardiopulmonary resuscitation was 36.3% in the first round and 39.7% in the following round; rate of staff having skills to manage convulsions was 34.5% in the first phase and reached phase 37% in second round, rate of those having skills on intubation 11.1% in 1st monitoring round and increase up to 18.3% in phase 2 of study [1].

According to Le Thanh Hai et al [1], during the emergency transport, the majority of patients required respiratory support (90%), circulation support (40%) and nerves support but only 11% transportation staff could perform intubation, about 1/3 of the transport staff could manage the emergency situation of heart-lung and nerve (in phase I). About 35% of medical staff transporting patients in the second study were trained in emergency care, higher than this rate found in phase 1 (p = 0.19), but emergency skills of these staff were not different significantly when compared to that obtained in the first study.

V. CONCLUSIONS AND RECOMMENDATIONS

Research results showed the shortage in human resources in emergency pediatric transport both in quantity and in qualifications, weak in knowledge and skills about emergency and not yet professional.

Attention should be expressed from all levels and branches in building up the emergency human resources, especially the emergency transport team for pediatric referrals with high professional qualifications and sufficient in number (at least 3 staff/team). Besides, there should be regular training courses for pediatric emergency officials, regular meetings, as well as seminars and symposiums to share experiences and disseminate techniques in emergency pediatric care, in order to reduce the number of deaths and increase the ability to recover health for children.

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KNOWLEDGE AND PRACTICE OF ROUTINE HAND HYGIENE OF NURSES AND MIDWIVES AT NATIONAL HOSPITAL OF OBSTETRICS AND GYNECOLOGY IN 2018

Cu Thu Huong[1], Ngo Van Toan[2]

SUMMARY

A cross-sectional study was conducted with the objective to describe nurse's knowledge and practices of hand hygiene in 2109 at National Hospital of Obstetrics and Gynecology. The results showed that the percentage of nurses and midwives with right knowledge about hand hygiene was 83.5%, the proportion of practice for the hand hygiene was 68.8%. The proportions of compliance sufficiently 5 moments for hand hygiene: before touching a patient (55%), after touching patient surroundings (56%), after touching a patient (82.6%), before cleaning and aseptic procedures (96.3%) and after contact with patient fluids (99.1%). Concerned necessary to monitor and supervise the practice of hand hygiene, focusing on two moments of before and after touching patients.

Key words: Knowledge, practice, hand hygiene, National Hospital of Obstetrics and Gynecology.

I. BACKGROUND

According to the World Health Organization (WHO), hospital-acquired infections (NKBV) are the infections that present after 48 hours after patient's hospitalization without present and not in the incubation period at the time of hospitalization. There are many agents causing hospital-acquired infections such as fungi, bacteria, viruses and parasites [1]. Hospital-acquired infections are one of the challenges and big concerns in Vietnam as well as worldwide. Many studies show that hospital-acquired infections increase morbidity, and mortality, last hospital stay and increase treatment costs. According to the statistics, the incidence of hospital-acquired infections account for about 5 - 10% in the developed countries and 15- 20% in the developing countries [2].

There are many factors influencing hospital-acquired infections such as: contaminated environment, infectious diseases, handling of instruments, invasive procedures, contaminated hands of health workers (HCWs) as a key link in the chain of hospital-acquired infections.

In Vietnam, according to a study by Nguyen Viet Hung (2007), 97.6% of health workers believe that hand hygiene reduces the risk of hospital-acquired infections in patient and 96.1% thinks that this will reduce hospital-acquired infections in health workers [3]. At the medical examination and treatment facilities, nurses have the most time to contact with patients. The majority of caring and treatment activities on patients are conducted by nurses / midwives. If a nurse/midwife's hand is infected, patient is at high risk of hospital-acquired infections.

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The National Hospital of Obstetrics and Gynecology is the leading hospital specialized in obstetrics and gynecology. The hospital is the highest level with the function of examination, emergency, treatment and prevention from diseases, every day the hospital receives thousands of patients to examine and treat, thus the matter of infection control is always a top priority by the hospital, especially hand hygiene. The hospital has been implementing the hand hygiene program under the guidance of the Ministry of Health. However, up to now, the hospital has not had any studies assessing the survey on compliance with routine hand hygiene and routine hand hygiene knowledge of nurses/midwives. Due to this fact, we conduct a study to describe the knowledge and practice of routine hand hygiene of nurses/ midwives in some departments under National Hospital of Obstetrics and Gynecology.

II. RESEARCH SUBJECTS AND METHODOLOGY

1. Subjects: The nurses and midwives who directly care for patients in 4 clinical departments: Emergency - Resuscitation Department, Department of Obstetrics on Infection and Department of Pathology Obstetrics and Obstetrics Department.

2. Methodology: Design: analyzed cross-sectional description. To select all nurses and midwives of the above departments (n = 109). Data collection: to interview by questionnaire, observe by checklist. SPSS 16 statistical software is used in data analysis. The research ethics issues: There is a voluntary consent of participation in the nurses and midwifery after being explained about the research objectives and procedures. The study ensures the confidentiality of personal information and only serves the protection of public health without other purposes.

III. RESEARCH RESULTS

1. Distribution of nurses, and midwives as per age and gender

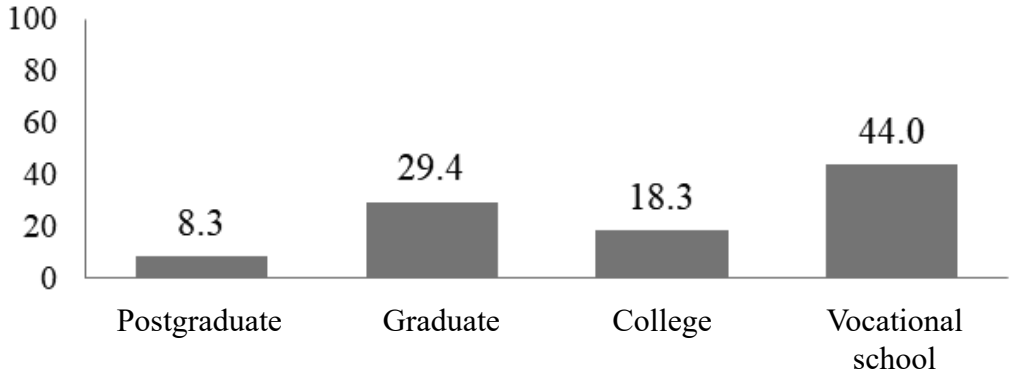
Table 1. Distribution of nurses, and midwives by age and gender (n = 109)

Information		Number (n = 109)	Proportion %
Age	≤ 29	48	44
	From 30 to 39	46	42.2
	From 40 to 49	11	10.1
	≥ 50	4	3.7
Gender	Male	2	1.8
	Female	107	98.2

The age group of 30-39 accounts for the highest proportion (42.2%) and the women group accounts for the higher proportion than the men (98.2% compared to 1.8%).

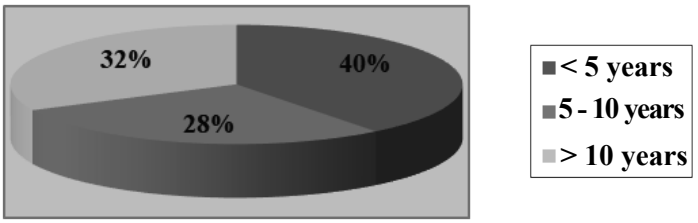
2/. Distribution of nurses and midwives as per qualifications and working seniority

Figure 1: Distribution of qualifications of nurses / midwives



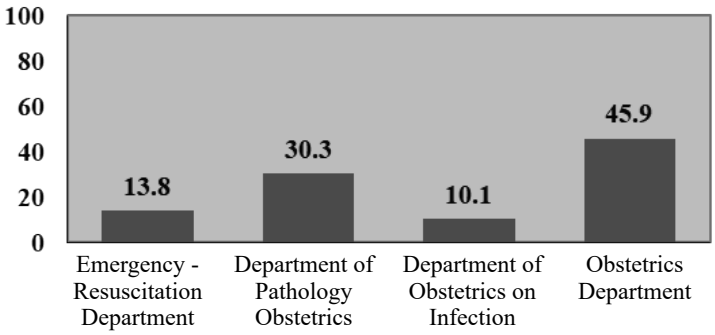
The nurses and midwives with postgraduate qualification account for the lowest proportion of 8.3%, the undergraduate qualification accounts for 29.4%; the college-level qualification is of 18.3%; the subjects with vocational education account for the highest proportion with 44%.

Figure 2: Working seniority distribution of nurses and midwives



The nurses and midwives with the working seniority for less than 5 years account for the highest proportion with 39.4%, followed by those with the working seniority of more than 10 years (32%) and from 5-10 years of working accounts for a proportion of 28.1%.

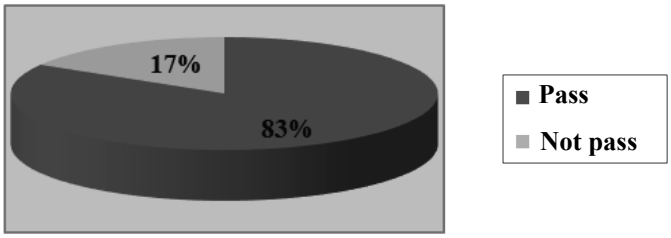
Figure 3: Distribution of nurses, midwives by working unit



The proportion of nurses/midwives is studied mainly at Obstetrics Department (45.9%), Department of Pathology Obstetrics (30.3%), Emergency - Resuscitation Department (13.8%) and Department of Obstetrics on Infection (10.1%).

3. Result of knowledge assessment on routine hand hygiene of nurses and midwives (n = 109)

Chart 4: Proportion of nurses and midwives with general knowledge about routine hand hygiene



The proportion of nurses and midwives with general knowledge about routine hand hygiene as per pass criteria accounts for 83.5%. The proportion of nurses and midwives who have general knowledge about routine hand hygiene without pass criteria reaches 16.5%.

4. Practice complience with routine hand hygiene of nurses and midwives (n = 109)

Table 2. Hand hygiene compliance proportion at 5 times/moments

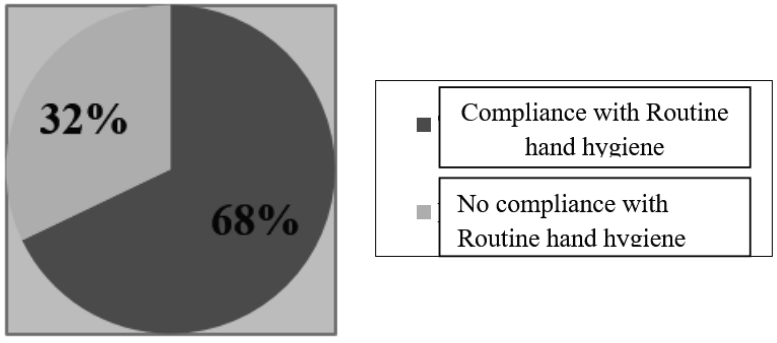
Hand hygiene time	Number (n = 109)	Proportion %
Before touching patients	60	55
Before aseptic procedures/techniques	105	96.3
After touching patients	90	82.6
After contacting with blood and body fluids	108	99.1
After contacting with utensils, surfaces around patients	61	56

Table 3. The proportion of nurses and midwives who comply with all steps of routine hand hygiene process

Steps	Right and adequate compliance		Incomplete compliance		No compliance	
	Number (n)	Proportion (%)	Number (n)	Proportion (%)	Number (n)	Proportion (%)
Step 1	101	92.7	8	7.3	0	
Step 2	85	78	22	20.2	2	1.8
Step 3	80	73.4	29	26.6	0	
Step 4	77	70.6	25	22.9	7	6.4
Step 5	64	58.7	35	32.1	10	9.2
Step 6	69	63.3	34	31.1	6	5.5

100% nurses and midwives all comply with Step 1 and step 3. 9.2% nurses and midwives ignore Step 5.

Figure 5. Routine hand hygiene practices of nurses and midwives



The proportion of nurses and midwives who practice routine hand hygiene satisfactorily is 68% and the unsatisfactory proportion is 32%.

IV. DISCUSSION

1. Routine hand hygiene knowledge of nurses and midwives

The research results show that the proportion of nurses and midwives who meet the requirements of routine hand hygiene knowledge is quite high (83.5%), the average score is 14.28, higher than the research result of Phung Van Thuy at Vinh Phuc General Hospital in 2014 that is 65.8% and that of Hoang Thang Tung at the National Lung Hospital in 2016 is 80.8% [4], [5]. A part of this result may be due to the training performance for the health workers on basic knowledge about routine hand hygiene of the National Hospital of Obstetrics and Gynecology in recent years.

Our research results show that 100% of nurses and midwives have the right knowledge about 5 times of routine hand hygiene before touching patients, before aseptic procedures, after touching patients, after contacting with blood and fluids. Most nurses and midwives are aware of the effective role of routine hand hygiene in which 99.1% of nurses and midwives think that the hand of health workers is an important element in the transmission of hospital-acquired infection and the health workers who follow the right procedure of hand hygiene will reduce the risk of infection in patients and themselves. However, 20.2% of nurses and midwives think that wearing clean gloves can replace hand washing.

The routine hand hygiene process consists of 6 steps arranged in the following: (1) Wet your hands with water, apply soap and rub 2 palms together; (2) Rub one palm over the dorsum and the outer fingers of the other hand and vice versa; (3) Rub your palms together, rub the gaps in your fingers; (4) Rub the outside of the fingers of one hand into the palm of the other; (5) Use this palm to turn the thumb of the other hand with one hand and vice versa and (6) Turn the tips of the fingers into the palm of the other hand and vice versa. Wash your hands under water to the carpus, and dry your hands. The compliance with the steps of the routine hand hygiene procedure to ensure the highest pathogenic potential skin areas for hands are likely to be prioritized to wash cleanly, thus the knowledge about the poor routine hand hygiene process will lead to nurses, and midwives' incorrect routine hand hygiene or missing steps, which do not maximize the effectiveness of the routine hand hygiene in hospital-acquired infection control, and can lead to the spread of pathogenic microorganisms to

colleagues, patients, their family members and the hospital environment. The research results for the proportion of nurses and midwives at the National Hospital of Obstetrics and Gynecology correctly present the steps of the routine hand hygiene procedure is (56%) higher than the research results at Vinh Phuc General Hospital in 2014 studied by Phung Van Thuy (40.1%) [4]. Meanwhile, in fact that at the hand hygiene locations of the National Hospital of Obstetrics and Gynecology is applied with the posters of the routine hand hygiene process including 6 steps issued by the Ministry of Health. This shows that there are still some nurses and midwives at the National Hospital of Obstetrics and Gynecology that haven't really paid attention to routine hand hygiene in accordance with the regulations. Therefore, more measures are required to monitor and promote the nurses and midwives to practice hand hygiene in the right way.

2. Practicing routine hand hygiene of nurses and midwives

In this study, the proportion of nurses and midwives complying with VST before aseptic procedure and after touching patients, after contacting with blood and body fluids reaches a high proportion of 96.3%, 82.6% and 100% respectively. The nurses and midwives comply with hand hygiene better than other times because these are the times at risk of causing infections. The proportion of nurses/midwives who comply with hand hygiene before touching patients is only 55% and the proportion of nurses and midwives who comply with routine hand hygiene after contacting with any utensils, surfaces around patients accounts 56%.

The difference in routine hand hygiene compliance proportion from time to time suggest that the nurses and midwives only pay attention to hand hygiene when there is a clear risk of infection, which can lead to any bad consequences for patients or nurses and midwives themselves. And where the risk of infection is low, nurses and midwives are less compliant with hand hygiene, thus a risk of cross-infection among patients due to the hands of nurses and midwives is predicted. The research results show that the proportion of nurses, midwives complying with routine hand hygiene is 68% higher than that of Hoang Thanh Tung at the National Lung Hospital in 2016 (55.9%) [5]. However, there are still 32% of nurses and midwives who do not comply with routine hand hygiene, which is a risk for cross-infection in the hospital. Therefore, the hospital should remind its health workers at training sessions and strengthen its oversight of routine hand hygiene compliance, especially at times of this low compliance.

The routine hand hygiene method of nurses, midwives serving the study is usually to apply hand hygiene solution containing alcohol (50.2%). This difference can be explained by the fact that the routine hand hygiene method with quick hand disinfection is increasingly popular and these nurses, and midwives in this study choose it to save their time and the alcohol-containing hand hygiene solution such as a quick hand sanitizer is applied in almost every procedure/techniques equipment. The results above clearly show that an alcohol-based hand sanitizer may be a better option because of the convenience it offers, without drying hands after applying, can be portable when working, not causing skin irritation, taking little time to perform, good bactericidal effect. The use of this solution is not required to invest in the construction of hand hygiene tanks, water and hand towels, but only requires chemical investment and installation of the system of tanks in the patient room and on the procedure

equipment that will be cheaper than the patient room's installation of tanks cost. Many studies have demonstproportiond that hand hygiene with an alcohol/alcohol-based hand sanitizer has the ability to kill bacteria better than hand hygiene methods using water and soap. Hand sanitizer with an antiseptic solution containing 70o alcohol can kill over 99.99% of bacteria on the skin of hands and maintain bactericidal effect within 180 minutes. Whereas hand hygiene using antibacterial soap only kills about 85% of bacteria and hand hygiene using soap usually only kills about 60% of bacteria [6]. The solutions for nurses, and midwives in particular and health workers in general complying with hand hygiene and other protective measures that are required to ensure the safety of patients and to protect the safety of health workers. The research results show that the compliance proportion of routine hand hygiene based on hand hygiene opportunity and the practice proportion of routine hand hygiene of nurses and midwives remain a low level, although the knowledge about this is quite high. This suggests that the reason leading to poor compliance with routine hand hygiene in nurses and midwives is not due to lack of knowledge, but also many other relevant elements and required to give more appropriate measures to improve compliance proportion and practice routine hand hygiene in nurses and midwives [7], [8].

V. CONCLUSION:

The knowledge about hand washing of nurses and midwives is quite good but some hand washing practices are not effective. The proportion of nurses and midwives who have the right knowledge about routine hand hygiene reaches 83.5%; The proportion of nurses and midwives practicing routine hand hygiene reaches 68.8%. The compliance proportion of hand hygiene at 5 times: before touching patients (55%), after contacting with utensils, surfaces around patients (56%), after touching patients (82.6%), before aseptic procedure (96.3%), after contacting with blood and body fluids (99.1%). It is required to continue inspecting and monitoring routine hand washing practices of midwives and nurses, focusing on hand washing before touching patients and after contacting with utensils and surfaces around them.

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KNOWLEDGE AND PRACTICE OF MOTHERS ABOUT SUNNING FOR THEIR INFANTS FOR VITAMIN D SUPPLEMENTATION IN HANOI, 2017

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ABSTRACT

A cross-sectional descriptive study with the purpose of describing knowledge and behaviors of mothers about sunbathing and supplying vitamin D for infants was conducted in 2 months. We interviewed the mothers in vaccination unit of Hanoi Preventive Medicine center through a semi-questionnaire. The study sample consisted of 389 mothers having children≤6 months old. Most mothers were office workers (n=242, 62.21%) and were highly educated (n=330, 84.83%). Sunlight was considered beneficial for bone health (n = 362, 93.06%) and neonatal jaundice (n = 289, 74.29%). 267(68.64%) mothers said that sunlight could not be harmful to their infants. Most participants (n = 296, 76.09%) were sunning their babies outdoors based on doctoral advice. While others were sunning their babies behind the window (n = 194, 49.87%). 7 mothers reported using sunscreen for their babies; 275 mothers were sunning their infants before 9 a.m; 45% mothers incorporate sunbathing and oral doses of vitamin D for vitamin D supplement. Most mothers were aware of the benefits of sunlight but they were displaying inappropriate behaviors while sunning their babies. More communication programs about sunbathing and vitamin D supplementation should be given.

Keywords: Sunlight; Knowledge and behaviors; Infants; Vitamin D supplementation

I. BACKGROUND

For centuries, sunlight has been considered an important energy source. In the second half of the 19th century, sunlight was considered bactericidal effect as well as a therapeutic role in rickets (1), (2). The best-known benefit of sunlight is its ability to boost vitamin D level of the body; most cases of vitamin D deficiency are due to lack of outdoor activities, specifically sun exposure (3). At least 1,000 different genes governing virtually every tissue in the body are now thought to be regulated by 1,25-dihydroxy vitamin D3 (1,25[OH]D), including several involved in calcium metabolism, neuromuscular and immune system functioning (3). Besides, people still use sunlight to treat neonatal jaundice (4).

However, sun exposure is also risk of skin cancer. The first report of sun exposure in related to skin cancer was announced on the dermatology publications in the late nineteenth century (3). Then we had many other reports of

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the same topic. There are three main forms of skin cancer: melanoma, basal cell carcinoma, and squamous cell carcinoma- are largely attributed to excessive UVR exposure. Skin cancers became the most common form of cancer worldwide, especially among groups such as white residents of Australia and New Zealand (3). For Asia, Grace K. Kim et al reported that although Asians displayed relative protection from basal cell carcinoma and squamous cell carcinoma, incidence rates of these non-melanoma skin cancers have been increasing over the past three decades (5).

Vietnam is a tropical country. Ultraviolet (UV) or UVI (UV) indexes in Hanoi are often high (6-7) and very high (8-10) by WHO and EPA (6),(7). When exposed to sunlight directly without protecting it can be risk of skin cancer. Meanwhile, there has not been a full report of kin cancer rate of the children under 6 months.

Today, there are many new recommends for prevention and treatment of infant vitamin D deficiency (8). In Vietnam, the rate of vitamin D deficiency and insufficiency in population was high (9) therefore doctors still advised mothers to sun their baby to supply vitamin D for their infants. However, many studies also showed the contrast between knowledge and practices about protecting for children from ultraviolet rays (1),(9),(10).

Our study explored knowledge and practices of mothers living in the city about sunlight exposure, sun protection for infants and the ways of vitamin D supplement.

II. OBJECTIVES AND METHODS

This is a cross-sectional descriptive study conducted in Hanoi, located in the tropical area. Hanoi is surrounded by abundant sunlight and high temperatures. The average annual total radiation in Hanoi is 122.8 kcal / cm^2 with 1641 hours of sunshine and the average annual air temperature is 23.6ºC, the highest in June (29.8ºC), the lowest in January (17.2ºC). The Preventive Medicine Center is located in Dong Da District, Hanoi, where many children are vaccinated, mostly in Hanoi.

The target population of the study included mothers attending to vaccination units of Hanoi Preventive Medicine Center for their children's routine vaccinations in two months from July to August in 2017, the sample size was calculated based on the WHO formula. We chose mothers whose child is under 6 months and has no chronic diseases and neonatal jaundice, lived in the inner city of Hanoi in the past 12 months and were able to answer the questions.

A semi-structured questionnaire based on the available questionnaire in the previous study was standardized by conducting a pilot survey.

In this study, collected data was entered into Epidata 3.1 software. Data were analyzed using descriptive methods and presented as % or mean +/- standard deviation (SD) by Stata 12 software.

The research protocol was approved by the Institute of Preventive Medicine and Public Health, approved by the Hanoi Preventive Medicine Center. The study was based on the consensus of all participants. All participants could stop interviewing at any time.

III. RESULTS

3.1. General characteristics off the study population

Table 1. General characteristics of participants

Variables	Number	%	Total (n %)
Education			389 (100%)
Primary or less	1	0.26	
Secondary school	7	1.8	
High school	26	6.68	
Intermediate	25	6.43	
Collage/ University or higher	330	84.83	
Occupation			389 (100%)
Farmer	4	1.03	
Worker	27	6.94	
Business	25	6.43	
Office worker	242	62.21	
House wife	56	14.4	
Others	35	9	

Table 1 shows the general characteristics of all participants. About 389 of mothers were enrolled in this study. The mean age of mothers was 29.5 ±4.5 years, range 18-46 years. The majority of mothers were office workers (n=242, 62.21%). More than four-fifths of mothers (n=330, 84.83%) were highly educated, no one was illiterate. The number of children selected ranged from 0 to 6 months of age, of which 28 (7.2%) were under 20 days of age.

3.2. Mother's health beliefs about benefits of sunlight and attitude towards skin cancer

As can be seen in table 2, most of the mothers (n= 362, 93.06%) reported that sunlight was good for bone development. Beside 6.94% of mothers did not agree or did not know about this advantage. In the case of jaundice, two-thirds of mothers said that sunbathing could solve physiological jaundice in the newborn (n = 289, 74.29%).

Table 2. Knowledge about sunlight

	Agreed n (%)	Not Agreed n (%)	Unknown n (%)	No idea n (%)	Total n (%)
Good for bone development	362 (93.06)	9 (2.31)	2 (0.51)	16 (4.11)	389 (100)
Good for jaundice	289 (74.29)	75 (19.28)	5 (1.29)	20 (5.14)	389 (100)

To the question: "Do you think your child will be at risk of skin cancer by sun exposure?", most mothers (n=267, 68.64%) believed that there is not at risk for skin cancer in children if apply suitably and sunning in the safe time. However, one- third of mothers (n = 108, 27.76%) who reported sun exposure in the first six months were still at risk for skin cancer.

3.3. Behavior about sun exposure and sun protection

Of the mothers surveyed, nearly half of mothers (n = 194, 49.87%) exposed their babies to the sun in front of a window while more than two-thirds of mothers (n = 296, 76.09%) reported to exposed their babies to outdoors. And most of the mothers (n = 382, 98.2%) did not use sunscreen for their children, whether on the beach or go out (Table 3).

Table 3. Behavior about sun exposure and sun protection

	Sunning behind the window n (%)	Sunning outdoors n (%)	Using sunscreen n (%)
Yes	194 (49.87)	296 (76.09)	7 (1.8)
No	195 (50.13)	93 (23.91)	382 (98.2)
Total	389 (100)	389 (100)	389 (100)

About one-third of participants (n=143, 37.4%) who exposed their babies to sun outdoors had gathered this information from doctors, while 82 participants (21.5%) claimed their information source to be their neighbors or relatives (Table 4).

Table 4. Source of information

Source of information	Number	%
Doctor	143	37.4
Midwife/nurse	10	2.6
Television/radio	68	17.8
Neighbor/ relative	82	21.5
Others	79	20.7
Total	382	100

The majority of mothers (n=275, 92.9%) who had answered the question about the timing of sun exposure reported to display appropriate behavior (sunning their infant before 9–10 a.m) and 18 mothers (sunning their infants in both two time before 10–11 a.m. and/or after 4 p.m. Nearly half of babies (53.9%) were reported to be exposed to sun longer than 15 minutes.

There were 7 mothers who answered using sunscreen for their children, in which information was obtained from newspapers and doctors. Three people wait 15 minutes after applying the cream before going out, 6 people use sunscreen with an SPF of 15 for a child, 1 user has an SPF of 20.

3.4. The tendency of vitamin D supplementation

For vitamin D supplementation, the majority of mothers (n = 172, 45%) chose to combine sunbathing and oral doses of vitamin D as advised by the doctor one- third of mothers chose to take only one dose Vitamin D (n = 82, 21.5%), 78 mothers combined all three ways of sunbathing, the oral doses of vitamin D and diet (20.4%). Most participants claimed their information source about using oral dose of vitamin D to be physicians and they have received advice to sunbathing from relatives or neighbors.

Table 5. The tendency of vitamin D supplementation

	Number	%
Sunbathing	11	2.8
Use oral dose of vitamin D	82	21.5
Diet / formula milk	1	0.26
Sunbathing & oral dose of vitamin D	172	45
Sunbathing & diet	1	0.26
Oral dose of vitamin D & diet	37	9.69
Sunbathing, oral doses of vitamin D and diet	78	20.4

IV. DISCUSSION

The main result of the study indicated that most mothers believed about the benefits of sunlight for their baby health, especially in terms of bone growth. This result is similar to previous studies (1). In addition, mothers also see sunbathing as a treatment for neonatal jaundice. This concept is taken from both medical staff and relatives. The proportion of mothers with this conception is higher in compared with previous studies (1) (4). In fact, there is no evidence of the effects sunshine for neonatal jaundice treatment (11) (12). In our study, this result is explained primarily by the fact that mothers living in Viet Nam mainly care for their children by long-standing beliefs. However, no study in Vietnam investigated the management of mothers when newborn jaundice.

When asked about the risk of skin cancer for young children in general, most mothers said that young children are not at risk for skin cancer in direct sunlight, especially with children under 6 months due to less outdoor lifestyle and cramped housing conditions. On the contrary, it was also a barrier that makes mothers less able to sunning infants for the health purposes. Studies on the risk of tanning skin cancer are indicated in tropical countries with similar sunlight conditions (4). But nowadays, most mothers stop at the benefits of sunshine without knowing the risks around the sun.

Most mothers are sunbathing outdoors for the purpose of bone strength and vitamin D supplementation. However, many mothers were sunning their children behind the glass door. According to pediatric specialists in Turkey, sunlight behind glass doors does not allow UV rays to trigger the synthesis of vitamin D so it does not achieve the desired health effects (13).

Similar to the results from other studies, the proportion of mothers who used sunscreen for children was very low (1) (12). Among mothers

who used sunscreen, most used sunscreen with SPF (SPF 15+). However, most mothers did not wait enough time after applying sunscreen and before exposing to sunlight. We believe that most mothers are not advised of the use of sunscreen.

Having surveyed on the trend of vitamin D supplementation for children, many mothers tended to combine sunbathe and the oral dose of vitamin D supplement. However, many mothers took the oral dose of vitamin D as directed by a doctor without sunning for children. Very few mothers noticed vitamin D supplementation through dairy products or a daily diet. In their condition, there have not many chances of sunning babies. No one knew about maternal preferences for different methods of vitamin D supplementation (14). Instead, if had, mothers tended to seek advice from health-care providers, but the counseling from health-care providers are not sufficient.

Our research has some limitations. The small sample size is not representative of the mothers living in the metropolitan area. Secondly, the study did not compare differences in knowledge and practice in different areas. Therefore, we propose to do another study on mothers living in rural areas.

V. CONCLUSION

Our study indicated that most mothers had found the role of sunlight to be good, especially for bone development. However, there are many limitations in providing formal information about the effects of sun exposure in Vietnam.

Medical staffs are the most important and reliable source of information for mothers. Therefore professional education is needed to change the health beliefs of health professional about the bad and good effects of sunlight as well as supply vitamin D for infants. Further research should be conducted to assess the knowledge and understand the attitudes about the effects and side effects of sunlight of health care professionals and mothers living in rural areas.

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CONFLICT OF INTERESTS

The authors declare no conflict of interests

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ASSESSMENT OF GROSS MOTOR FUNCTION IN CHILDREN CEREBRAL PALSY RELATED TO MENINGITIS OR ENCEPHALITIS AT VINMEC TIMES CITY INTERNATIONAL HOSPITAL

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SUMMARY

Objective: Assessment of gross motor function in children cerebral palsy related to meningitis or encephalitis at Vinmec Times City International Hospital. **Subjects**: 28 patients were diagnosed with cerebral palsy related to meningitis or encephalitis at Vinmec Times City International Hospital from April 2015 to July 2019. **Method:** Rehabilitation physicians in Vinmec Times City conducted a general examination, assess gross motor function (GMFM), and classify children with cerebral palsy related to meningitis or encephalitis by gross motor function (GMFCS). **Result**: GMFM-88 average score of children with cerebral palsy related to meningitis or encephalitis was low in sitting, crawling, kneeling, standing, walking, running, jumping and there are not significant differences between the level GMFCS statistics for each age group. **Conclusion**: Among 28 meningitis or encephalitis patients, the majority of them in level 4 and 5 according to GMFCS scale and there were not GMFCS differences between 3 age groups. Their GMFM gross motor function was much low.

Keywords: Meningitis or encephalitis, cerebral palsy, muscle tone, gross motor function.

I. INTRODUCTION

Meningitis is an inflammation of the thin membrane covering the brain and spinal cord (1). Encephalitis, meanwhile, is an inflammation of the brain parenchyma, manifested by neurological dysfunction - focal or diffuse psychosis (2). Both groups of diseases have left a lot of serious neurological sequelae to sufferers such as hearing loss, vision loss, cognitive impairment, speech disorders, behavioral problems, motor impairment and seizures, even leading to cerebral palsy in children (3). In 2015, the number of cases of meningitis and encephalitis worldwide was 8.7 million and 4.3 million, respectively (4, 5). In Vietnam, the proportion of acute encephalitis in about 10 years tends to decrease from 3/100.000 cases/year to 1,4/100.000 cases/year. (6). However, the disease will progress rapidly and potentially cause serious neurological damage, potentially leading to cerebral palsy if it is not treated promptly. The current commonly used treatments include: medication, rehabilitation exercises that increase gross motor skills, stem cell transplantation(7). The Gross Motor Function Classification System (GMFCS) is a tool to evaluate the gross motor function of children with cerebral palsy after encephalitis and meningitis accurately and objectively, it allows to evaluate very small changes about gross motor function of children with cerebral palsy such as lying, sitting, crawling, standing, walking, running(8). The assessment of gross motor function for children with cerebral palsy due to encephalitis, meningitis plays an important role in determining the vulnerability level about the child's gross motor. However, in Vietnam as well as in the world, there has not

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been any assessment of the gross motor function of children with cerebral palsy after encephalitis, meningitis. Therefore, we conduct this study to assess the status of gross motor function of children with cerebral palsy after encephalitis, meningitis.

II. SUBJECTS AND METHODS OF THE STUDY

2.1. Subjects and methods of study

We do study on 28 children with cerebral palsy after encephalitis, meningitis treated at Vinmec Times City International General Hospital from April, 2015 to July, 2019. The study was approved by the Ethics Council in Biomedical Study, Vinmec Times City International General Hospital No. 381/2015/QD-Vinmec on October 30, 2014.

2.2. Methods and tools of study

Doctors whose specialization in rehabilitation conduct a physical examination and assessment of gross motor function (GMFM) and classify children with cerebral palsy after encephalitis and meningitis according to gross motor function (GMFCS). The rough motor function classification in children with cerebral palsy (GMFCS) was first developed in 1997, expanded in 2007 by Robert P, professor of physiotherapy at Drexel University, Belgium. Classification according to GMFCS resolves the goals set by the World Health Organization on the classification of disabilities in children, a classification system focused on what children with cerebral palsy can do that are linked to factors of living environment. GMFCS pays special attention to the ability to sit and walk. With 5 levels, differentiate levels of clarity and be easy to apply in clinical.

Gross motor ability of children were assessed in 5 fields with a total score of maximum 264 points including parts: lying and rolling over include 17 sections with a total score of 0 to 51; sitting with 20 sections with a total score of 0 to 60; crawling and kneeling consist of 14 sections with a total score of 0 to 42; standing includes 13 sections with a total score of 0 to 39; walking, running, jumping include 24 sections with a total score of 0 to 72. The way to give point each section is as follows (each section is a movement): 0 = Children cannot start an activity; 1 = The child can start an activity and perform <10% of the activity; 2 = Children can do part of an activity (10 to less than 100% of the activity); 3 = The child can do an entire activity (100% of the activity) (8).

Raw points will be entered into a computer using the GMAE mobility estimation software to calculate the total point of each field or convert GMFM-88..

2.3. Statistical analysis

Descriptive statistics are used to describe the characteristics of children with cerebral palsy after encephalitis, meningitis. Implementing inspection when the square is used to analyze the relationship between age and GMFCS level. Statistical significance is achieved when the value of p is less than 0.05. Data analysis was performed by using STATA statistical software version 12.0.

III. RESULTS AND DISCUSSION

Characteristics of study subjects

A total of 28 children with cerebral palsy after encephalitis, meningitis participated in the study. In particular, female children account for the largest proportion of 56.6%, while male children account for 46.4%. Children at the age of 5 and under have the highest rate of 50.0%, followed by children at the age of 5-10 years old, accounting for 35.7%, the children at the age over 10 have the lowest rate of 14.3%. In particular, point to assess GMFCS of level 5 accounts for the largest proportion of 64.3%, followed by GMFCS level 3 and 4 both account for 14.3%, the remaining level 2 accounts for 7.1%. In the study of Professor Liem and colleagues, the proportion of GMFCS level 5 accounts for 60%, level 4 accounts for 35% and level 2 accounts for 5%, without levels 1 and 2 (7).

Table 1: Characteristics of the study subjects

General information		N = 28 (100%)
Gender	Male	13 (46.4%)
	Female	15 (53.6%)
Age	Under 5 years old	14 (50.0%)
	5-10 years old	10 (35.7%)
	Over 10 years old	4 (14.3%)
Level of GMFCS	Level 2	3 (7.1%)
	Level 3	4 (14.3%)
	Level 4	4 (14.3%)
	Level 5	18 (64.3%)

Assessment of gross motor function

When assessing the gross motor function of children with cerebral palsy after encephalitis, meningitis, the child's average GMFM-88 point is 27.3. In which, the functions of lying and rollig over have the highest average point of 32.6, followed by the function of sitting with an average point of 21.3, the remaining functions of crawling, kneeling, walking, standing, running with an average under 8.2 points. The proportion of performing gross motor movements in the study of Professor Liem and colleagues in children with cerebral palsy related to asphyxiation of oxygen is 12% and perform 32% of movements 6 months after stem cell transplantation (7).

Table 2: Assessment of gross motor function of children with cerebral palsy after encephalitis, meningitis

Gross motor function	n=28 mean (SD)
Total point of GMFM-88	27.3 (24.3)
Lying and rolling over	32.6 (12.9)
Sitting	21.3 (21.1)
Kneeling and crawling	8.1 (14.3)
Standing	4.0 (9.3)
Walking, standing, running jumping	5.3 (13.2)

Relationship among levels according to GMFCS scale by age group

Regarding the severity of children with cerebral palsy after encephalitis, meningitis, children under 10 are mostly at level 5, level 4 accounts for the highest rate in children over 10 years old. However, there is no difference with statistical significance between the level of GMFCS and age group with the value of p> 0.05. (see details in table 3)

Table 3: Relationship between the level of cerebral palsy according to GMFCS scale and age

Level of GMFCS	Nhóm tuổi			p-value
	Under 5 years old N (%)	5-10 years old N(%)	Over 10 years old N(%)	
Level II	0 (0%)	1 (10.0%)	1 (25.0%)	0.053
Level III	3 (21.4%)	0 (0.0%)	1 (25.0%)	
Level IV	1 (7.1%)	1 (10.0%)	2 (50.0%)	
Level V	10 (71.4%)	8 (80.0%)	0 (0.0%)	

IV. CONCLUSION

Among 28 children with cerebral palsy after encephalitis, meningitis, GMFCS at level 4 and 5 accounts for the majority by classification and there is no significant difference among the levels of GMFCS by age group. Gross motor function GMFM of children with cerebral palsy after encephalitis, meningitis is low. The assessment showed that children with cerebral palsy after encephalitis, meningitis can only mainly perform movements of lying and rolling over, the rest movements of crawling, kneeling, walking, standing and running are implemented very few. It is necessary to conduct an early evaluation of gross motor function for children with cerebral palsy after encephalitis, early meningitis can improve GMFCS levels through early interventions such as rehabilitation education, stem cell transplantation.

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CURRENT SITUATION OF HEALTHCARE RESOURCES AT COMMUNE LEVEL IN BORDER AREAS OF TAY NGUYEN FROM THE YEAR 2014-2016

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ABSTRACT:

Objectives: This article provides a research on the status of healthcare resources at commune level in border areas of Tay Nguyen (high land) (2014-2016)

Subject and Methods: This paper uses cross-sectional study, along with data retrospective method to describe healthcare situation in 28 commune-level health stations border areas of Tay Nguyen**.**

Results: Commune Health system (CHS) have enough health staff; however, they lack a structure of professional qualifications.92.86% of CHS have doctors, of which 88.46% are general practitioners, only 3.85% are traditional medicine doctors and 7.69% are pediatricians. The percentage of unskilled doctors remains high, accounting for 57.69%. All CHS have their own facilities;most of them do not have enough functional departments as prescribed. Their equipment is still lacking compared to regualtions, especially basic equipment for medical examination and special treatment.

Conclusion: There is a lack of human resources and facilities in healthcare systems at commune level in border areas of Tay Nguyen (high land).

Keyword: Resources, commune health system, border areas of Tay Nguyen

I. BACKGROUND:

There are 28 communes and 12 districts of Kon Tum, Gia Lai, Dak Lak, Dak Nong sharing a border with Laos, Cambodia, including 530 km of border line, of which Laos has 142 km, Cambodia has 388 km.This area has the lowest socioeconomic status and the poorest transportation system in Tay Nguyen.Health care for people in the border area of Tay Nguyen is still heavily dependent on grassroots health care, especially at commune and village levels. However, this area encounters many difficulties in human resources, medical infrastructure and equipment. The medical management in some aspects is limited; the quality of health care is still inadequate. Therefore, many health indicators such as health care services and others of Tay Nguyen is slowly improved compared with other regions and with general level of the country. Hence, a research on the status of health resources at the commune level in Tay Nguyen is very necessary. This is a scientific basis to develop solutions to improve the medical examination and treatment capacity of communes.

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Objectives: *Research on the status of healthcare resources at commune level in border areas of Tay Nguyen (2014-2016).*

This article's data dues to the state level research "Research on the intervention increasing the ability to protect the public health in the national frontier in Tay Nguyen and to create goods from the local herbs. Code: TN16/T03".

II. SUBJECTS AND METHODS

2.1. Subject, location, time of study

*Subject

- Commune health workers.

- Commune Health system

- Activities related to health care and medical treatment implemented in 28 communes in Tay Nguyen.

*Location and time of study

- Location: The research was conducted in 28 communes in Tay Nguyen:

Order	Province	Number of border districts	Number of border communes
1	Kon Tum	3 districts (Dak Glei, Sa Thay, Ngoc Hoi)	10 communes
2	Gia Lai	3 districts (Chu Prong, Duc Co, Ia Grai)	7 communes
3	Dak Lak	2 districts(Buon Đon, Ea Sup)	4 communes
4	Dak Nong	4 districts(Cu Jut, Dak Mil, Dak Song, Tuy Duc)	7 communes
	Total	12 districts	28 communes

-Time: From 12/2016 to 4/2017.

2.2. Research methods

*** Research design:**

This paper uses cross-sectional study, along with data retrospective method to describe healthcare situation in 28 commune-level health stations border areas of Tay Nguyen

Content and research indicators:

Resources of health centers: human resources of CHS, regional polyclinics, Commune Health system, private medicines and pharmacies, infrastructure, facilities, medicine of CHS.

+ Assessment of facilities of Commune Health system and regional polyclinics: based on Decision No. 1020 / QD-BYT dated March 22, 2004 (Amending Decision No. 437 / QD-BYT dated February 20, 2002) of the Minister of Health [1], [2].

+ Assessment of medicine in CHS (with doctor or without doctor) based on Circular No. 31/2011 / TT-BYT dated July 11, 2011 issued by the Ministry of Health and guidelines on the list of medicine used in Commune Health system paid by health insurance [3].

+ Assessment of Human Resource: Based on Joint Circular No. 08/2007 / TTLT-BYT-BNN dated 05 June, 2007 issued by the Ministry of Health and Ministry of Home Affairs[4].

+ Assessment of medical treatment techniques applied by the CHS (based on Decision No. 23/2005/QD-BYT of the Ministry of Health)[5].

Method of data collection

- Secondary database survey from Commune Health system records.

- Interviews with heads of Commune Health system.

Data analysis method:

-Data *clean*ning:

+ Filled-in questionnaires are collected to test their validity and are edited, added wrong/missing information at a survey site.

+ Check an clean data after it is entered into computer.

-Data analysis:

+Use SPSS statistical software to perform the analysis.

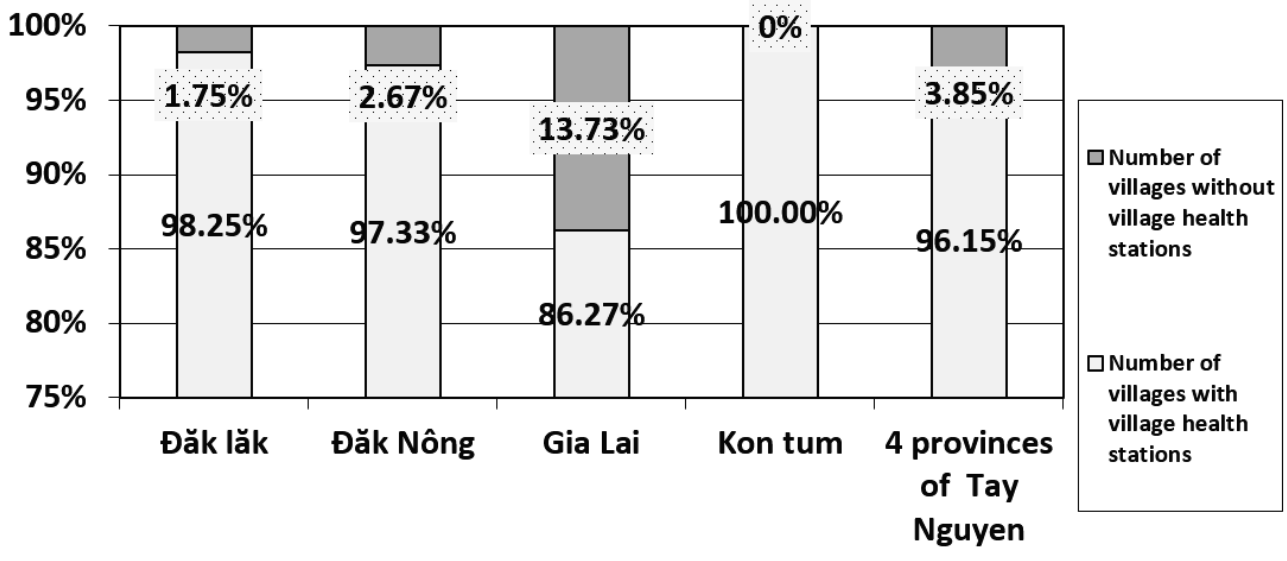
+Data Analysis: Use descriptive statistics and analyze.

III. RESULTS AND DISCUSSION

3.1. Characteristics of human resources of grassroots health care in the border areas of Tay Nguyen.

**** Village health station***

Chart 3.1. Information on village health workers operating in Tay Nguyen border area



The percentage of villages with village health workers is 96.15%. Kon Tum and Dak Lak have the highest proportion of village health workers in Tay Nguyen (100% and 98.25%, respectively).

All 28 border communes have CHS, of which 26 CHS (92.86%) have doctors working at the station; 21 CHS (75%) in 3 provinces (Kon Tum, Dak Lak, Dak Nong) have medical civil-military interaction at CHS

****Some personal characteristics of doctors working in Tay Nguyen Region's CHS***

Table 3.1. Some personal characteristics of doctors working in commune Health system in the border areas of Tay Nguyen (n=26)

Personal characteristics	Proportion %
Age	
≤ 35	34.62
36 – 40	19.23
> 40	46.15
Sex	
Male	61.54
Female	38.46
Regular staff	61.54
Contract employee	38.46
Position	
Head of health station	76.92
Health station worker	23.08
Qualification	
General practitioner	88.46
Traditional medicine doctor	3.85
Pediatrician	7.69

Of the 26 doctors in the communes, the number of people aged 36-40 is 19.23% and the age over 40 is 46.15%. Male accounts for 61.54% and females account for 38.46%. 61.54% of doctors in the communeis regular staff in the health system, the rest are still contracted. The majority of doctors working at CHS are head of CHS (76.92%).

Training and retraining of the doctors working in the border area of Tay Nguyen Region's Commune Health system:

Table 3.2. Percentage of physicians who are working for CHS in the border area of Tay Nguyen after retraining according to their training program

Re-training program	Quantity (n=26)	Proportion %
Obstetrics/Population / Family Planning	7	26.92
Management	5	19.23
Speciality	2	7.69
Traditional medicine	1	3.85
Pediatrics	2	7.69
Primary health care	1	3.85
Electrocardiogram	1	3.85
Not trained	15	57.69

The table above shows that the training content is mainly: Obstetrics - Population - Family planning, management, speciality, traditional medicine, pediatrics, primary health care, electrocardiogram. 26.92% of physicians after graduation are trained in obstetrics and population - family planning; 19.23% of doctors are trained in management, only 7.69% of doctors are trained in specialty and 3.85% are trained in traditional medicine.

Table 3.3. Opinions on the program of undergraduate training of doctors working in Commune Health system in the border area of Tay Nguyen

Opinions on the program of undergraduate training	Quantity (n=26)	Proportion %
Enough knowledge and skills	13	50.0
Not enough knowledge and skills	13	50.0
Training program is lack of knowledge and skills		
General medical examination and treatment	3	11.54
Specialized medical examination and treatment	10	38.46
Traditional medicine	2	7.69
Management of household health	2	7.69
Management of clinics	4	15.38
Others	2	7.69

The table shows that 50% of doctors working at the Commune Health system in the borderarea of Tay Nguyen claim that training program in the university is insufficient to carry out medical examination and treatment as well as management at the Commune Health system. Among the respondents, the lack of knowledge and skills in that program is 38.46%, suggesting that the training content is lacking in specialized subjects (such as facial teeth, Ear – Nose - Throat, eyes, dermatology). 15.38% of doctors believe that training program is lacking in management of CHS.

Self-evaluation of the completion of doctors' responsibility

Table 3.4. Proportion of self-evalutation of work complete of doctors in CHS in the border area of Tay Nguyen

Results	Quantity (n=26)	Proportion%
Good	17	65.38
Not good	9	34.62

The above table shows that 34.62% of doctors say that they did not complete their duty in Commune Health system and 65.38% answer they well completed their work.

Difficulties often encountered by doctors working at the CHS

Table 3.5. Reasons for not doing well at the CHS of doctors working in the border area of Tay Nguyen

Reasons	Quantity(n=26)	Proportion%
Lack of knowledge	4	15.38
Lack of equipment	9	34.62
Lack of medicine	4	15.38
Lack of professional documents	7	26.92
Unrest	3	11.54
Low income	8	30.77

Reasons given for failing to complete the assigned tasks are lack of medical equipment and tools 34.62%, followed by low income (30.77%), lack of professional documentation (26.92%), lack of knowledge (15.38%) and lack of medicine (15.38%). In particular, 11.54% of physicians have not fulfilled their assigned tasks because they are not satisfied with their work at the Commune Health system..

3.2. Current status of infrastructure, medical facilities at grassroots level in the border area of Tay Nguyen

Location, area and structure of the Commune Health system in Tay Nguyen

The results of the survey on the location, area and structure of the 28 Commune Health system in the border area of Tay Nguyen are presented in the following table.

Table 3.6. Location, area and structure of the 28 Commune Health system in the border area of Tay Nguyen

Indicator	Province				Total (n =28)
	Dak Lak (n=4)	Dak Nong (n=7)	Gia Lai (n=7)	Kon Tum (n=10)	
1. Location -% Of station having their own facilities	100.0	100.0	100.0	100.0	100.0
-% of station in the commune center / near an important route	75.0	85.7	85.7	90.0	85.7
2. Area -Average Area / Station (m^2)	637.50±309.23	885.71±401.78	869.29±398.04	800.00±426.87	815.54±386.34
-Average area of the main block (m^2)	365.00±242.97	256.86±181.75	256.57±117.94	314.20±219.78	292.71±186.30
3.Structure of the main block -% of fortified house	25.0	25.7	26.4	40.5	31.1
-% of dilapidated/ temporary dwelling	75.0	74.3	73.6	59.5	68.9

All Commune Health system in the border area of Tay Nguyen have their own facilities. Most of the Commune Health system are located in the commune center or near the main road. Each station has 292.71±186.30m^2 of work, most of which are dilapidated/temporary dwelling (68.9%).

**** * Functional department of CHS in the border areas of Tay Nguyen***

Results of investigating the presence of functional departments at 28 CHS in 4 provinces are shown in the following table.

Table 3.7.Functional department of CHS in the border areas of Tay Nguyen

Functional Department	Province				Total (n =28)
	Dak Lak (n=4)	Dak Nong (n=7)	Gia Lai (n=7)	Kon Tum (n=10)	
-Advisory	50.0	71.4	42.9	40.0	50.0
-Receptionist	75.0	57.1	71.4	70.0	67.9
-First-aid, consulting room	75.0	85.7	85.7	90.0	85.7
-Family Planning Services	50.0	71.4	85.7	60.0	67.9
-Delivery room	75.0	85.7	100	70.0	82.1
-Labour ward	50.0	71.4	57.1	50.0	57.1
-Treatment	75.0	71.4	100	70.0	78.6
-Central sterile supply/services department	25.0	42.9	42.9	30.0	35.7
-Traditional medicine	25.0	28.6	14.3	20.0	21.4
-Drugstores	25.0	42.9	42.9	30.0	35.7

The percentage of Commune Health system that do not have full functional rooms is high. Commune Health system have delivery rooms (82.1%); first aid room (85.7%); Treatment room for patients (78.6%); Other functional divisions account for 21.4% - 67.9%.

**** Basic equipment for health services of the border area of Tay Nguyen***

Result of the survey of basic equipment for health care activities of 28 border health stations in the four Tay Nguyen's provinces are shown in the following table.

Table 3.8.The rate of the station has basic equipment for health services of Commune Health system in Tay Nguyen

Equipment	Province (%)				Total (n =28)
	Dak Lak (n=4)	Dak Nong (n=7)	Gia Lai (n=7)	Kon Tum (n=10)	
-Stethoscope	100.0	100.0	100.0	100.0	100.0
-Sphygmomanometer	100.0	100.0	100.0	100.0	100.0
-Thermometer	100.0	100.0	100.0	100.0	100.0
-Syringe	100.0	100.0	100.0	100.0	100.0

-Ear, nose and throat instruments	50.0	71.4	57.1	50.0	57.1
-Oral and maxillofacial instruments	25.0	42.9	42.9	30.0	35.7
-Equipment for pregnant woman/ family planning	75.0	85.7	85.7	90.0	85.7
-Media equipment for health education	50.0	71.4	85.7	60.0	67.9
-Sterilization equipment	75.0	85.7	85.7	70.0	78.6
-Village-level medical bags	75.0	85.7	71.4	90.0	82.1
-Clean delivery bag	75.0	57.1	71.4	80.0	71.4
-Equipment for primary processing and preservation of traditional medicines	25.0	28.6	14.3	20.0	21.4

All border health stations in Dak Lak; Dak Nong; Gia Lai and Kon Tum have all three types of equipment are Stethoscope, Sphygmomanometerand Thermometer.

Other types of medical equipment have a lower rate, with 85.7% of stations having equipmentfor obstetrics and family planning, 78.6% of sterilization equipment, and village health bags: 82.1%, clean delivery bags: 71.4% media equipment for health education: 67.9%, specialized equipments: ear nose and throat, oral and maxillofacial surgery (57.1% 35.7%), the lowest is equipment for pre-processing and preserving oriental medicine (21.4%).

IV. CONCLUSION

The staff of the commune health clinic is sufficient in number, but lacks in the structure of professional qualifications. The percentage of station having doctors is 92.86%, of which 88.46 are general practitioners, only 3.85% are traditional medicine doctors and 7.69% pediatricians. The proportion of unskilled doctors remains high, accounting for 57.69%.

Commune Health system: all Commune Health system have their own facilities; most of them do not have enough functional rooms as prescribed. The equipment of the Commune Health system is still lacking compared with the regulations, especially the basic equipment for specialized amedical examination and treatment.

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STUDY THE EFFECTIVENESS OF THE INTERVENTION TO IMPROVE THE MEDICAL EXAMINATION AND TREATMENT CAPACITY OF THE COMMUNE HEALTH STRATIONS IN THE BORDER AREAS OF TAY NGUYEN

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SUMMARY

Aims: To evaluate the effectiveness of the intervention to improve the medical examination and treatment capacityofthe commune health strations in the border areas of the Central Highland. **Subjects and methods:**intervention study with the commune health stration and 240 households in Ia – Púch (intervention commune), the commune health stration and 240 households in IaMơ (control commune) from 4/2017 to 4/2018. **Results:**The average number of patient visitsof the intervention group increased from 0.73 to 0.92 visits per person per year (an increase of 0.19 visits per person per year).Interventions effectiveness is 19.45%. The satisfaction of people on medical facilities at the commune health strations has increased in the intervention group after intervention, this difference is statistically significant ($p < 0.05$). The satisfaction of the people about waiting time before examination, procedures of treatment, availability of medicines, medical examination fees,attitudes of health staffs increased, not statistically significant.**Conclusions:** Interventionsimproved the capacity of the commune health strationseffectively.

Keywords: The medical examination, border areas of Tay Nguyen.

I. INTRODUCTION

There are 28 communes of12 districts of 4 provinces(Kon Tum, Gia Lai, DakLak and Dak Nong)in the border areas of Tay Nguyen[1]. The border line with Lao and Cambodia is 530 km. This is the area with the most difficult economic, social and transportation conditions in Tay Nguyen. Health care in the border areas of Tay Nguyen is still heavily dependent on grassroots health care, especially at commune and village health levels. Therefore, it is very necessary to research and develop the solutions to improve the medical examination and treatment capacityofthe commune health strations.Our aim is to evaluate the effectiveness of the intervention to improve the medical examination and treatment capacityofthe commune health strations in the border areas of Tay Nguyen.

This article's data dues to the state level research "Research on the intervention increasing the ability to protect the public health in the national frontier in Tay Nguyen and to create goods from the local herbs. Code: TN16/T03".

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II. OBJECTIVES AND METHODS

2.1. Objectives

28 the commune health strations of 12 districts of 4 provinces (Kon Tum, Gia Lai, DakLak and Dak Nong) in the border areas of Tay Nguyen.

2.2. Methods

2.2.1. Study design

Intervention study.

2.2.2. Selection of research samples

- Sample size of household survey with intervention group:

The sample size was estimated using this following formula:

$$n = \frac{\left((z_{\alpha/2}\sqrt{2\bar{p}(1-\bar{p})} + z_{1-\beta}\sqrt{p_1(1-p_1)+p_2(1-p_2)}\right)^2}{(p_1-p_2)^2}$$

Therein:

n: minimum intervention sample size

p1: estimated percentage of sick people receiving medical treatment before intervention

According to the results of the reseach: "Financial solutions in health care for rural people in 04 districts in the Central Highlands and Bac Giang in 2006" (PhD thesis in public healthof Nguyen Khanh Phuong), the proportion of sick people receiving medical treatment in the 4 weeks prior to the survey is 58.6%.

P2: The hypothesis suggests that interventions may increase the proportion of sick people being treated, estimated at 73.6% (up to 15% compared to before intervention).

= (p1 + p2)/2

Zα/2 = 1,96 (the value of the standard deviation for the degree of reliability α =5%)

Zβ = 0,84 (the value of the standard distribution for the desired sample forceβ = 80%).

Therefore, the number of people involved in the intervention group is:

$$n = \frac{\left(1{,}96\sqrt{2x0{,}661x0{,}339} + 0{,}84\sqrt{0{,}586x0{,}414 + 0{,}736x0{,}264}\right)^2}{0{,}15x0{,}15} = 155$$

Thus, the minimum sample size to conduct the intervention study is 155 people.

On average, each household selected one household head to conduct interviews.
Thus, the minimum sample size to conduct research for each group is 155 households, in fact we have investigated 240 households.

- Sample size of household survey with control group:

In the control commune, the number of households surveyed was at least equal to the number of households surveyed in the commune. In fact, 240 households have been surveyed.

- Sampling:

+ Select communes:

Select intervention commune: selectively, in 28 communes were selected for descriptive study.

Select 01 commune that not only has low rate of sick people receiving medical examination and treatment but also has not reached the national health standard for the period of 2001-2010 and the access of people to health services is difficult. In fact, the intervention study was carried out in the Ia - Puch commune of Chu Prong district, Gia Lai province.

Select the control commune: Select the commune corresponding to the intervention commune in terms of disease incidence, health resources of the commune health care, natural and social conditions (Ia - Puch commune). During the field survey, Ia Mo commune which belonged to the same district of Chu Prong, Gia Lai province,

met the requirements and was selected for the control group.

+ Household selection: make a list of all households in the control and intervention commune. Randomly selected 240 households in the commune intervention and 240 households in the control commune to conduct pre and post intervention survey.

Exclusion criteria:

+ Heads or respondents of households refuse to participate.

+ Persons who are sick within 4 weeks prior to the survey date.

2.2.3. Perform intervention program

- Intervention time: from 4/2017 to 4/2018.

- The commune health strations interventions:

+ The commune health strations interventions is determined based on the facilities and equipmentsregulationsof the National health standard in the period 2001-2010.

+ Investment contents include:

Facilities intervention: repairedthehouse, painted the wall.

Equipments intervention: provided medical examination equipments, nose and throat examination equipments, dentomaxillofacial examination equipments, patientbeds and table balances.

Staff training intervention:collaborated with Hospital 211, the 3rd Corps to organize professional training courses for commune health staffs.

+ To build medical and military clinics (border medical ward and the commune health stration):support for commune health care to improve the examination and treatment ability.

- Communication interventions:

Open 01 training course for communal communication staff on communication skills. Strengthening the communication through loudspeaker and radio of the village, integrating into the village and commune meetings to popularize people on methods to prevent some common diseases.

2.2.4. Evaluate results after intervention

Results before and after the intervention were compared in three dimensions:

- Survey and compare preintervention group with control group.

- Survey and compare postintervention group with control group.

- Survey and compare preintervention group with postintervention group.

2.3. Data processing methods

Data were processed by computerized statistical methodusing SPSS 18.0 software.

Interventions effectiveness is calculated using the following formula:

$$\text{Efficiency index (\%)} = \frac{X1-X2}{X1} \times 100 \text{ (Intervention group)}$$

$$\text{(Before – after) index (\%)} = \frac{X1-X2}{X1} \times 100 \text{ (Control group)}$$

X 1: Pre-intervention index

X2: Post-intervention index

Interventions effectiveness = (Efficiency index) – (Before – after index)

III. RESULTS

3.1. The effective nessofinter vention saccording to the average number of people visiting the the commune health strations per year

Table 3.1.The effective nessofinter vention saccording to the average number of patient visits

Groups	Preintervention (visits per person per year)	Postintervention (visits per person per year)	Efficiency index (%)
Intervention	0.73	0.92	26.03
Control	0.61	0.65	6.58
Interventions effectiveness (%)			19.45

The table shows that the average number of patient visits of the control group was almost unchanged. In contrast, the average number of patient visitsof the intervention group increased from 0.73 to 0.92 visits per person per year (increased 0.19 visits per person per year). Interventions effectiveness is19.45%.

3.2. Effectiveness of intervention on facilities and equipments at the commune health stration

Table3.2. Effectiveness of intervention on facilities and equipments at the commune health strations

Facilities and equipments at the commune health strations	Preintervention		Postintervention	
	Ia – Púch	Ia – Mơ	Ia – Púch	Ia – Mơ
The clinic's rooms				
- Media room	-	-	-	-
- Reception room	-	-	+	-
- Drugstores	-	-	+	-
- Examination room	+	+	+	+
- Family planning services	+	+	+	+
- Delivery room	+	+	+	+
- Postpartum care room	-	-	+	-
- Treatment room	+	+	+	+
- Pasteurize room	-	-	+	-
- Traditional medicine clinic	-	-	+	-
- Dentomaxillofacial, ENT and eye clinic.	-	-	+	-
- Consulting room	-	-	+	+
Traditional medicine garden				
- Traditional medicine garden	+	+	+	+

- Traditional medicine garden with 20-40 plants	+	+		+
- Traditional medicine garden with more than 40 plants			+	
Health education materials				
- Enough			+	
- Not enough	+	+		+

The the commune health stration (Ia - Puk commune of Chu Prong district, Gia Lai province) has its own consulting room, dentomaxillofacial, ENT and eye clinic, traditional medicine clinic after intervention.

The traditional medicine garden has been supplemented with medicinal plants to ensure that the garden has 40 or more medicinal plants. The stration has also provided enough health education materials for community. The infrastructure of control the commune health strationafter 1 year intervention unchanged.

3.3. The effectiveness of interventions at the households

Table 3.3. The initialmanagementof patients

Initial management of patients	Control group				Intervention group			
	Pre-intervention (n=86)		Post-intervention (n=114)		Pre- intervention (n=104)		Post- intervention (n=108)	
	n	%	n	%	n	%	n	%
No treatment	6	6.98	4	3.51	17	16.35	5	4.63
Buy drugs at the drug stores	33	38.37	29	25.44	34	32.69	7	6.48
Take available medicine at home	15	17.44	12	10.53	18	17.31	8	7.41
Visit the village health	6	6.98	12	10.53	3	2.88	8	7.41
Visit the the commune health stration	13	15.12	36	31.58	20	19.23	54	50.0
Visit the regional clinic	1	1.16	1	0.88	0	0.0	1	0.93
Visitthe district hospital	5	5.81	2	1.75	4	3.85	3	2.78
Visitthe provincial hospital	1	1.16	0	0.0	1	0.96	3	2.78
Visit the central hospital	2	2.33	2	1.75	0	0.0	2	1.85
Visit the private health facilities	1	1.16	13	11.40	6	5.77	10	9.26
Visit traditional medicine physician	3	3.49	1	0.88	0	0.0	1	0.93
Invite doctors to the house	0	0.0	2	1.75	1	0.96	4	3.70
Others	0	0.0	0	0.0	0	0.0	2	1.85

It can be seen in the table thatthe percentage of visiting the the commune health strationin the intervention group increased from 19.23% to 50.00%.The percentage of buying drugs at the drug storesand take available medicine at homedecreasedfrom 32.69% to 6.48% in the intervention group, from 38.37% to 25.44% in the control group.

Table 3.4.Evaluation of the intervention's effectiveness increasing the use of public health services among residents

Group	Pre-intervention (%)	Post-intervention (%)	Efficiency index (%)
Intervention	29.81	67.60	126.77
Control	26.74	47.36	77,11
Interventions effectiveness (%)			49.66

The percentage of usingpublic health services increased in the intervention group (37.79%) and the control group (20.62%). Interventions effectiveness is49.66%. This difference is statistically significant (p <0.05).

3.4. The effectiveness of interventions on the people's satisfaction

Table 3.5.The effectiveness of interventions on the people's satisfaction

	Group	Pre-intervention (%)	Post-intervention (%)	Efficiency index (%)
Waiting time before examination	Intervention	50.42	83.75	66.15
	Control	47.92	57.92	20.87
	Interventions effectiveness (%)			45.28
Procedures of treatment	Intervention	44.58	82.92	86.00
	Control	42.50	52.08	22.54
	Interventions effectiveness (%)			63.46
Equipments	Intervention	35.83	42.50	18.62
	Control	34.17	30.83	-9.78
	Interventions effectiveness (%)			28.40
Availability of medicines	Intervention	39.58	47.92	21.07
	Control	38.75	43.33	11.82
	Interventions effectiveness (%)			9.25
Attitudes of health staffs	Intervention	46.67	95.42	104.46
	Control	39.17	46.25	18.08
	Interventions effectiveness (%)			86.38
Medical examination fees	Intervention	35.42	72.08	103.50
	Control	31.67	38.75	22.36
	Interventions effectiveness (%)			81.14

This table shows thatthe satisfaction of people on medical facilities at the commune healthstrations has increased in the intervention group after intervention, this difference is statistically significant ($p < 0.05$). The satisfaction of the people about waiting time before examination, procedures of examination, availability of medicines, medical examination fees, attitudes of health staffs have increased, not statistically significant.

IV. DISCUSSION

Advanced facilities:To improve the quality of medical examination and treatment, in addition to improving the professional level for medical staff, the improvement of facilities is very important. Facilities and attitudes of health staffs have improved significantly. Therefore, people are more confident in the commune health strations. The quality of treatment has been improved in the intervention group. The the commune health stration (Ia - Puk commune of Chu Prong district, Gia Lai province) has its own consulting room, dentomaxillofacial, ENT and eye clinic, traditional medicine clinic, traditional medicine garden with more than 40 plants, provided enough health stration after intervention. Thus, compared to the control group, facilities of intervention the commune health strations has increased significantly and reached the commune health standards by 2010 [2]. This is one of the important factors to improve the quality of Ia-Púch the commune health stration. The view of investment in facilities is also in line with Nguyen Kim Chau (1996)[3].

Improve communication efficiency: communication and health education at the intervened the commune health strationis particularlynoticed both of the speaker and the consulting room. Intervention the commune health strations has consulting room.

All of these interventions are aimed at improving the quality of health services and are valued through customer satisfaction.Results of our study showed that in the intervention group, the proportion of satisfied patients with waiting time increased from 50.42% to 83.75% (Interventions effectiveness: 45.28%), the proportion of the satisfied patients with the procedure of treatment increased 44.58% to 82.92% (Interventions effectiveness: 63.46%), the proportion of satisfied patients with equipments increased from 35.83% to 42.50% (Interventions effectiveness: 28.40%) and the proportion of satisfied patients with the attitudes of health staffs increased from 46.67% to 95.42%(Interventions effectiveness: 86.38%).

Our research shows that the effective nessofinter ventionson the use of services at health stration sis quite good.In the control group, the average number of visits before and after the intervention was almost unchanged (0.61 vs. 0.65 visits per person per year). In contrast, in the intervention group, the average number of visits before and after the intervention increased significantly (from 0.73to 0.92 visits per person per year). Interventions effectiveness is 19.45%.

The rates of visits to public health facilities (the commune health strations, district hospitals, provincial and central hospitals) in both intervention and control groups increased (29.81% and 26.74% before intervention, 67.60% and 47.36% after intervention). The percentage of usingpublic health services increased in the intervention group (37.79%) and the control group (20.62%). Interventions effectiveness is49.66%. This difference is statistically significant ($p < 0.05$).

The National Health Survey 2001-2002 also showed that the number of visiting the commune health strations which were equipped with standard medical instruments (stethoscope, temperature measurement, bloodpressure measurement), reproductive health examination instruments (adult weight scale, birth table, family planning tools, gynecological examination instruments, fetalstethoscopes, pelvicmeasurements, pregnancy stick tests), specialist examination instruments (instruments for eye, ear, noseandthroat

examination) ishigherthan othercommunes[4]. The number of visits to communes which having enough equipments for medical examination ishigher than other communes. This is the effectiveness of our interventions at the commune health strations. It demonstrates the effectiveness of our intervention based on evidence of the use of treatment services by people in the intervention communes. It has also been studied by a number of foreign authors [5].

V. CONCLUSION

Interventions improvedthe examination and treatment capacityofthe commune health strationseffectively.

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