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Lean Approach to Processes Regarding Nursing Activities at Hospital: Evaluation of Nurses' Views

Cigdem Torun Kilic, Havva Ozturk

Karadeniz Technical University, Faculty of Health Sciences, Department of Nursing, Trabzon, Turkey.

Correspondence Author: Cigdem Torun Kilic
E-mail: cigdemtorunkilic@gmail.com

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ABSTRACT

Objective: The study was planned to evaluate views of the nurses about lean approach to processes related to nursing activities.

Methods: The descriptive study was conducted with 178 (71.2%) nurses selected from a total of 250 nurses working at six public hospitals in Artvin Province. The data were collected with a survey consisting of questions regarding the nurses demographic features and their views about lean approach to nursing activities at hospitals and then analyzed with percentages and chi-square tests.

Results: In the study, 46.1% of nurses stated that the unit where they worked needed lean approach partly. The nurses with graduate degree supported this view more (p=0.034). These nurses stated that the activities to receive belongings of patients during patient admission (21.3%), to fill in patient discharge form during discharging process (16.4%), to perform the hygienic and other care applications of the patients and to record them on the nurse observation form of daily nursing activities (11.1%) were unnecessary. In addition, they explained that activities to shave patients before operation (9.4%) and to enter physicians' orders by nurses into the system in laboratory process (13.5 %) and to in monitoring process (20.8%); to send all patient files to the pharmacy with the personnel for drug/device supply in pharmacy process (14.3%), were unnecessary.

Conclusion: The unnecessary nursing activities were defined in the nursing processes regarding patient admission and discharge processes, daily nursing workflow, operating room processes and laboratory, monitoring, blood centre, pharmacy processes. It is recommended that these processes identified may provide lean approach by eliminating them.

Keywords: Nursing, hospital, lean management, lean approach.

1. INTRODUCTION

Today, health institutions need to regulate their organizational structures and management methods in order to continue their activities in national and international arena and survive in an increasingly competitive environment (1,2). One of these regulations is lean management, which is one of the current and contemporary management approaches that are used in institutions (3-5).

Lean management includes the elimination of waste and the delivery of the product/service to the customer in the fastest way with minimum downtime by focusing on the concept of value in the production process of products or services (5-7). In other words, to be lean is to be purify from everything that is not really needed. Moreover, it means getting more with less human effort, less equipment, less time and less space (2,8).

By reducing costs and increasing the capacities, the lean approach/management enables developing and facilitating the activities in health institutions. It encourages and empowers employees to develop themselves avocationally (9,10). It shortens business processes, improves patient flow, increases patient safety and satisfaction (2,8,11). It also eliminates waiting times, repetitive activities, errors and unnecessary activities (12-15). The Institute for Health Improvement (IHI) has also reported that the lean approach has led to 45%-75% increase in productivity, 25%-55% decrease in costs, 50%-90% decrease in faults, 60%-90% decrease in stock and 50%-90% decrease in waiting times (16). In a study carried out in a Canadian hospital, it was found that the lean approach led to a 20% increase in hospital efficiency (17).

Lean management is also an important approach in terms of nursing services which are an integral part of health services.

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Because the activities containing nursing services include complex procedures, repetitive processes and procedures, long work periods. However, as nurses are inexperienced in lean approaches, they cannot focus on patient care which is their main duty (11). In this direction, in some studies conducted with the nursing group on lean management, it was determined that the activities in nursing services needed lean applications (12,18,19) and 50% of all American hospitals carried out some kind of continuous improvement activities involving lean techniques (18). In addition to this, in a study conducted by the American Society of Quality in 77 hospitals, it was found that 53% of the employees used a form of lean, 42% of them used one of the lean tools and 4% of them used purely lean approach (20). While there is a limited number of studies on lean management in nursing services in the international arena, could not found any study carried out in Turkey. There are only two studies carried out by the Ministry of Health on lean management in two pilot hospitals in Bolu and Kahramanmaraş provinces in Turkey. However, these studies are general hospital management rather than nursing services. Therefore, raising awareness about the effects of the lean management system on nursing services and evaluating the processes to be leaned based on the views of nurses will contribute to the effectiveness and increase the efficiency of a large part of health services (11). In this direction, the study was carried out to evaluate the views of nurses about the lean of the processes related to nursing activities in wards and units.

2. METHODS

2.1. Participants and Samples

The population of this descriptive study consists of 250 nurses working in six public hospitals in a province of Blacksea Region of Turkey. In this research, the whole population was tried to be reached by not selecting a sample. The study was conducted with 178 (71.2%) volunteers who participated in the study and who were not on leave during the study period. The limitation of this study is that it is conducted only with the opinions of nurses working in six public hospitals of Artvin province.

2.2. Research Instruments and Procedures

Data were collected by "Information Form" and "Nursing Services Business Process Survey". Ethical permission for the study was obtained from the Faculty of Medicine Scientific Research Ethics Committee, Karadeniz Technical University (No: 2016-191, Date: 23.01.2017).

2.3. Information Form

It consists of nine questions; seven questions related to the age, gender, marital and educational status of the nurses, position, working year in the hospital and ward-unit, also two questions including information about the concept of lean hospital and the need for lean approach of the ward/unit.

2.4. Questionnaire of Nursing Services Business Processes

It was prepared by the researchers in line with the Quality Standards in Health-Hospital in order to define unnecessary activities by defining nursing business processes (21). In addition, one day nursing functions were observed by the researcher working in the hospital where the study was conducted in six different wards selected from special units such as internal medicine, surgery, emergency and intensive care, operating room for the identification of business processes, and arranged in the light of group meetings with hospital managers. The questionnaire was prepared by creating a standard work schedule within the scope of standardized work including the patient admission and discharge, daily nursing workflow, operating room processes, laboratory, monitoring centre, blood centre, pharmacy nursing activities. (Table 3). Activities related to the processes were evaluated by the nurses under the options of 'being done, not being done' and 'necessary, unnecessary, rarely necessary'.

2.5.Data Collection Method

The relevant forms were distributed to the participants and they were given one week to complete the forms. One week later, the forms were collected by the researcher.

2.6. Statistical Analysis

The data on the demographic characteristics of nurses, their activities in nursing services, whether nurses were performing in their clinics or if they found it necessary, were analyzed with percentage and average tests. In addition, chi-square test was used to compare the demographic characteristics of nurses, their knowledge status and views on lean approach.

3. RESULTS

42.7% of the nurses are 31-40 years old, 92.7% are women, 79.8% are married and 46.1% have bachelor's degree and master degree education. 64% of the nurses did not have knowledge of the lean hospital approach and 46.1% stated that the unit they work in need of partial lean approach (Table 1).

Nurses with bachelor's/master degree education supported the need for leanness of the unit in which they work more than the nurses with a vocational high school and associate degree (χ^2=10.426; p=0.034<0.05) (Table 2).

Table 1. *Distribution of demographic characteristics of nurses and their views on lean hospital concept and knowledge status (n=178)*

Distribution of Demographic Characteristics of Nurses		n	%
Age	20-30 age	59	33.1
	31-40 age	76	42.7
	40 years and older	43	24.2
Gender	Woman	165	92.7
	Man	13	7.3
Marital Status	Married	142	79.8
	Single	36	20.2
Educational Background	Health Vocational High School	33	18.5
	Associate Degree	63	35.4
	Bachelor\Master Degree	82	46.1
Position	Nurse	166	93.3
	Executive Nurse	12	6.7
Working Year in Hospital	1-5 year	91	51.1
	6-10 year	35	19.7
	11-15 year	14	7.9
	16-20 year	23	12.9
	20 years later	15	8.4
Working Year in Ward/Unit	1-5 year	120	67.0
	6-10 year	33	18.0
	10 years later	25	14.0
	Total	178	100.0
Opinions and Information Status of Nurses		**n**	**%**
Knowledge of Lean Hospital Concept	Yes	64	36.0
	No	114	64.0
Lean approach need of the ward/unit	Yes	53	29.8
	No	43	24.2
	Partly	82	46.1
	Total	178	100.0

Table 2. *Comparison of opinions and knowledge status of lean hospital concepts according to education of nurses*

Demographic Characteristic	Having knowledge about the concept of lean hospital				The situation of the unit in need of lean approach					
	Yes		No		Yes		No		Partly	
Educational Background										
Health Vocational High School	10	30.3	23	69.7	9	27.3	13	39.4	11	33.3
Associate Degree	18	28.6	45	71.4	20	31.7	18	28.6	25	39.7
Bachelor\Master Degree	36	43.9	46	56.1	24	29.3	12	14.6	46	56.1
χ^2 and p value	χ^2 =4.198 p=0.123				χ^2 =10.426 p=0.034					

When the nursing activities in the work flow process are evaluated, 74.6-99.4% of the nurses stated that the 31-item admission and discharge activities were performed in wards/units and 49.4%-98.6% found these activities necessary. 21.3% of the nurses mentioned it is unnecessary to receive the patient's valuables and record them, 16.4% to record all the data related to the pre-assessment to the nursing plan by the nurse, 15.9% to submit a copy to the patient/patient relative by filling out the discharge and training form (Table 3).

In the daily work flow process, 87% – 99.4% of the nurses consisted of 58 items daily nursing activities were performed in wards/units and 77.4% – 100% found these activities necessary. 11.1% of the nurses found it unnecessary to perform the hygienic and other care applications of the patients and to record them on the nurse observation form, 10.9% of the nurses found it unnecessary for the nurse on the day shift to prepare drugs and devices for evening treatments, 10% of the nurses found it unnecessary to prepare nursing observation forms for use the next day (Table 3).

In the process of patient who will go to surgery and come, 88.1% – 100% of the nurses stated that they did the related activities consisting of 21 items in the wards/units and 82.7%-95.9% found these activities necessary. 9.4% of the nurses found it unnecessary to shave and provide shave control of the surgical site. 7.8% of the nurses found it unnecessary to take the patient from the operating room by a nurse and helper staff. Besides, 7.5% of the nurses found it unnecessary to deliver the patient to the operating room accompanied by the nurse with the necessary forms. (Table 3).

Table 3. *Nurses processes including nursing activities and their views on necessity of activities*

NURSING ACTIVITIES	Necessary		Unnecessary		Rarely Necessary	
PATIENT ADMISSION AND DISCHARGE PROCESS						
Activities Related to Patient Admission Process	**n**	**%**	**n**	**%**	**n**	**%**
Introduces himself to the patient	53	65.4	8	9.9	19	23.5
Patient and patient relatives are directed to the patient room	60	89.6	3	4.5	4	6.0
Explain the room presentation and usage for the patient's adaptation to the room	55	78.6	7	10.0	8	11.4
Department unit is introduced to the patient	50	70.4	7	9.9	13	18.3
The patient is introduced to the medical team in the ward	42	49.4	18	21.2	22	25.9
Relatives of the patient are informed about telephone, food, visitor, companion, hotel, parking facilities	50	71.4	9	12.9	10	14.3
The patient's valuables are received and recorded	44	58.7	16	21.3	13	17.3
The patient's drugs are delivered and recorded with the expiry date and quantity	51	78.5	9	13.8	3	4.6
If the patient cannot meet his / her needs, he / she is helped to wear his / her clothes and taken to the patient bed.	41	62.1	7	10.6	17	25.8
All patients admitted to the ward are pre-evaluated within 4 hours.	58	92.1	1	1.6	3	4.8
The patient's life signs are taken and recorded.	54	93.1	1	1.7	2	3.4
Pre-evaluation form of the patient is completed	51	87.9	2	3.4	4	6.9
NRS2002 form is completed	35	71.4	4	8.2	8	16.3
In adults, itaki falls risk form is completed	48	81.4	3	5.1	5	8.5
In children, harizmi falls risk form is completed	48	80.0	3	5.0	7	11.7
Patient-specific risk assessments (nutritional risk assessment, pressure sore risk assessment, etc.) are performed in the department.	52	81.2	2	3.1	9	14.1
Risk assessment form is signed by the patient's relatives	49	77.8	9	14.3	4	6.3
All information and results of this preliminary assessment are recorded in the nursing care plan	50	74.6	11	16.4	4	6.0
According to the preliminary assessment, the patient's needs and problems are identified and a patient-specific care plan is prepared.	57	80.3	8	11.3	4	5.6
Patient treatments are arranged according to the treatment plan of the physician	68	98.6	0	0.0	1	1.4
The necessary procedures are performed for routine tests requested by the physician (blood collection, x-ray etc.)	63	98.4	1	1.6	0	0.0
Informed consent is given to the relatives of the patients before the applications, and informed consent form is signed by obtaining verbal consent.	59	84.3	7	10.0	3	4.3
Patients' relatives are informed about their right to refuse or terminate treatment, the consequences of their decisions and responsibilities.	61	89.7	1	1.5	4	5.9
Information's are recorded and signed by the patient's relatives and physician with a general informed consent form.	50	87.7	2	3.5	3	5.3
Other treatments and follow-ups that are appropriate to the request of the physician are made and recorded.	56	96.6	1	1.7	0	0.0
Activities Related to Discharge Process						
The patient's file, all information and documents of the patient are collected.	43	93.5	1	2.2	2	4.3
The files of the patients who will be discharged will be delivered to the secretary.	49	90.7	2	3.7	1	1.9
The patient is given discharge training and recorded on the patient training form.	49	79.0	4	6.5	7	11.3
The patient is discharged and the training form is completed and a copy is delivered to the patient-patient's relative.	42	66.7	10	15.9	9	14.3

The patient is assisted in preparing for discharge.	39	60.0	8	12.3	17	26.2
The patient's delivered goods, drugs; prescription information is delivered to the patient.	52	86.7	3	5.0	4	6.7
ACTIVITIES RELATED TO DAILY WORKFLOW PROCESS						
During the shift change, the ward is delivered between the nurses: ward order, life signs devices, narcotic drugs and notebook, heat and humidity charts, patient and nurse rooms and order, information about missing drug and consumables is exchanged.	60	98.4	0	0.0	1	1.6
After the delivery of the ward, the delivery of the patient is done by visiting the patient rooms in order: general status of the patient, the follow-up of the received and resistance, consultation status, the things to be done during the day of imaging centre and laboratory centre, drug applications	59	98.3	1	1.7	0	0.0
Preparing, applying and recording the treatments at 08.00 am hours: the treatments prepared for this shift from the previous day and added to the nurse observation sheet are written on the drug cards, which are specific to the patient.	54	93.1	4	6.9	0	0.0
These papers are glued onto syringes and serums.	53	93.0	3	5.3	1	1.8
Drugs are removed from the cupboards which are special for the patients and put on the table. 08.00 am treatment or medicines are prepared.	50	100	0	0.0	0	0.0
Prepared drugs with patient identification information are placed on the treatment cart according to the room numbers.	43	91.5	1	2.1	2	4.3
Patients are treated in the patient's room at 08.00 am.	40	95.2	0	0.0	2	4.8
The treatments are recorded on the nurse observation form.	53	100	0	0.0	0	0.0
Blood glucose measurements of patients are made.	51	86.4	2	3.4	6	10.2
If the blood sugar abnormal condition is notified to the physician.	60	98.4	0	0.0	1	1.6
Insulin is taken from the refrigerator in the nurse's room and administered to the patient.	60	98.4	0	0.0	1	1.6
The life signs of the patients are taken and recorded on the nurse observation form.	58	96.7	1	1.7	1	1.7
Patient visits are made with physicians.	56	96.6	2	3.4	0	0.0
The process related to laboratories is carried out.	56	96.6	1	1.7	1	1.7
The process for monitoring centres is performed.	51	92.7	2	3.6	2	3.6
The blood centre process is carried out	52	96.3	1	1.9	1	1.9
The process for the patients who will undergo surgery is performed.	45	91.8	3	6.1	1	2.0
The process for patients who will come from surgery is performed	49	94.2	2	3.8	1	1.9
The process for patients to be discharged is performed.	51	92.7	2	3.6	1	1.8
Cleaning of the service rooms and patient order is provided.	51	98.1	1	1.9	0	0.0
Patients with special conditions are admitted to private rooms.	49	89.1	3	5.5	2	3.6
If there is a patient admission process is initiated.	49	92.5	3	5.7	1	1.9
Care plans for the needs and problems of the patients are prepared and evaluated after the patient visit and evaluation of the nurses at each shift change.	51	85.0	5	8.3	4	6.7
If there is a change in the patient's nutritional, pressure sores, fall risk score or the general condition of the patient with an interval of eight hours, the services are re-evaluated and the care plan is rearranged according to the results.	48	77.4	2	3.2	11	17.7
Other treatments and follow-up are made according to the request of the physician and the results are recorded on the nurse observation form.	46	90.2	3	5.9	2	3.9
According to the daily drug regulations of physicians, drug and consumables process is carried out from pharmacy.	48	88.9	4	7.4	2	3.7
Hygienic and other care practices of the patients are made and recorded on the nurse observation form.	42	77.8	6	11.1	5	9.3
Lunch is provided in accordance with diets and help the patient who cannot eat.	47	83.9	1	1.8	8	14.3

12.00 am o'clock treatments are prepared and applied.	46	90.2	2	3.9	3	5.9
Life signs are taken at 12.00 am.	47	92.2	1	2.0	3	5.9
At 14.00, treatments are prepared and applied.	44	89.8	2	4.1	3	6.1
Nurse observation forms are prepared for use the next day.	42	84.0	5	10.0	3	6.0
Treatments are prepared at 04.00 pm.	41	85.4	3	6.2	4	8.3
The necessary devices and drugs are put on a tray for evening shift treatments for the nurse who will come to the evening watch.	36	78.3	5	10.9	5	10.9
Service is arranged before the delivery of the guard.	49	94.2	1	1.9	2	3.8
Treatments are applied at 04.00 pm.	45	95.7	0	0.0	2	4.3
Service and patient delivery is made to the nurse who comes to the night shift.	42	95.5	1	2.3	1	2.3
Blood glucose is measured and insulin is given at 05.00 pm.	40	85.1	1	2.1	6	12.8
It is ensured that dinner is served in accordance with diets and the patient who is unable to eat is assisted.	37	80.4	1	2.2	8	17.4
Physicians who come to visit at the end of the working hours are maked one's rounds.	49	94.2	1	1.9	2	3.8
The treatment changes of the physicians are recorded on the nurse observation forms prepared for the same day and the next day.	51	94.4	2	3.7	1	1.9
The treatment trays prepared by the day nurses are taken to the medicine room and the drugs are prepared.	44	95.7	1	2.2	1	2.2
Treatments are made at 08.00 pm.	46	93.9	1	2.0	2	4.1
After treatment at 08.00 pm, signs of life are taken.	47	97.9	0	0.0	1	2.1
Blood glucose is measured and patients are given insulin.	44	89.8	0	0.0	5	10.2
Treatments are made at 00.00.	44	93.6	1	2.1	2	4.3
Treatments are made at 02.00. am	44	84.6	3	5.8	5	9.6
Blood tests to be taken at 05.00 am are entered into the laboratory module.	49	94.2	1	1.9	2	3.8
Lab glues barcodes to tubes.	49	87.5	3	5.4	3	5.4
Groups the tubes by room number and leaves them on the table.	40	88.9	3	6.7	2	4.4
The patient's blood is collected by verifying the patient's identity and the blood is sent to the laboratory.	50	96.2	1	1.9	1	1.9
Blood glucose is measured and patients are given insulin.	44	89.8	0	0.0	5	10.2
If there is a dying patient, the physician is notified and the dying patient care process is initiated.	53	93.0	1	1.8	2	3.5
Treatments are prepared and applied at 06.00 am.	48	92.3	1	1.9	3	5.8
After treatment, life signs are taken at 06.00 am.	50	96.2	0	0.0	2	3.8
Nurse observation forms are distributed to the patients.	38	86.4	3	6.8	3	6.8
It is ensured that breakfast is served in accordance with diets and the patient who is unable to eat is assisted.	44	88.0	2	4.0	4	8.0
Records the seizure in the seizure book.	53	94.6	2	3.6	1	1.8
OPERATING ROOM PROCESSES						
Activities Related to Patients Going to Surgery						
Relatives of the patients are informed about the operation and anaesthesia process.	42	93.3	2	4.4	1	2.2

Pre-op patient evaluation form is completed.	46	93.9	2	4.1	1	2.0
General / Regional Anaesthesia Informed Consent Form for surgical intervention is signed by the patient / his / her relatives and physician.	46	93.9	2	4.1	1	2.0
Preoperative blood components are requested from the blood unit, and after preparing the blood unit, it is taken to the service for the patient.	44	88.0	4	8.0	2	4.0
Pre-routine routine assays are completed and checked (laboratory tests, radiology tests, EKG etc.)	44	93.6	2	4.3	1	2.1
The patient's clothes, metal items, if any, the denture is removed and dressed in a patient scrub.	47	95.9	1	2.0	1	2.0
If necessary, shaving or shaving of the operation area is provided.	45	84.9	5	9.4	3	5.7
Patient delivery form and safe surgical checklist are filled in before the patient leaves the clinic.	48	90.6	2	3.8	2	3.8
The patient is delivered to the operating room with the necessary forms under the supervision of a nurse.	47	88.7	4	7.5	2	3.8
Pre-operative, patient preparation and delivery of the patient to the operating room is performed by the nurse who performs the transfer of authentication.	47	92.2	3	5.9	1	2.0
Activities Related to Patients Coming from Surgery						
The nurse and assistant personnel go to the operating room to pick up the patient from the operating room.	46	90.2	4	7.8	1	2.0
The anaesthesia technician and operating room nurse informs the ward nurse of the about the type of anaesthesia, the unusual conditions during the operation, the drugs used, the drains, catheters, catheters and the general condition of the patient.	50	100	0	0.0	0	0.0
The nurse verifies the patient's identity.	45	100	0	0.0	0	0.0
It is checked whether all forms of the patient are completed and signed completely, and the nurse receives the patient with the fields in the related forms completed.	43	95.6	1	2.2	1	2.2
The patient is taken to the room in the ward unit accompanied by nurses and service personnel.	43	93.5	1	2.2	2	4.3
Upon admission to the ward, life signs are monitored until the patient's condition is stable.	43	89.6	1	2.1	4	8.3
The physician is informed in case of changes in the patient's condition and follow-up results.	45	95.7	0	0.0	2	4.3
The postoperative treatment plan ordered by the physician is applied by the nurse and the effects and side effects of the drug are monitored.	45	95.7	0	0.0	2	4.3
All treatment, follow-up and care records of the patient are recorded on the nurse observation form.	44	95.7	0	0.0	2	4.3
The relatives of the patients are informed about the postoperative nutrition, mobilization, analgesic application times and all the procedures to be performed.	45	91.8	2	4.1	2	4.1
Visitor restrictions are made.	43	82.7	2	3.8	7	13.5
SUPPORT SERVICES						
Activities Related to Laboratories						
Laboratory requests requested by the physician are entered into the system by the nurse.	43	82.7	7	13.5	2	3.8
Blood and other assay samples to be taken are entered into the laboratory module by the nurse.	44	86.3	6	11.8	1	2.0

The barcode is pressed by the nurse and attached to the tubes.	46	92.0	3	6.0	1	2.0
Blood and other test samples are taken from the patient by the nurse.	50	98.0	1	2.0	-	-
The samples taken with the personnel are sent to the laboratories.	50	94.3	2	3.8	1	1.9
Activities Related to Monitoring Centres						
The physician is called to find out the type of X-ray, MR and CTs requested by the physician. After the type and purpose of the diagnosis is learned, the nurse enters the system.	40	75.5	11	20.8	2	3.8
The imaging center is called and the appointment time is taken.	44	88.0	4	8.0	2	4.0
When the appointment time approaches, the patient is sent to the centre accompanied by the staff. If necessary, the nurse accompanies the patient.	43	86.0	5	10.0	2	4.0
After the patient comes from the centers, he is taken to bed and the treatment is started.	45	93.8	3	6.2	0	0.0
Blood Center Activities						
The laboratory is searched for the presence of the desired blood components.	48	92.3	3	5.8	1	1.9
The blood product ordered by the physician is entered into the system from the blood centre and requested by telephone.	51	98.1	0	0.0	1	1.9
She takes blood from the patient for a cross match.	51	98.1	0	0.0	1	1.9
The cross blood and filled blood components are sent to the blood unit by personnel.	54	96.4	1	1.8	1	1.8
Consent form for blood transfusion is explained and signed to the patient and put in the patient file.	54	98.2	0	0.0	1	1.8
By searching the blood unit of the laboratory, it is learned whether the blood components are prepared or not.	47	94.0	1	2.0	2	4.0
When the blood components are ready, they are brought to the service with the personnel.	49	92.5	3	5.7	1	1.9
Pharmacy Activities						
The drug of all patients is entered into the pharmacy module according to the daily physician's request.	49	94.2	2	3.8	1	1.9
Request is made from the system for consumables.	48	92.3	2	3.8	2	3.8
All patient files are sent to the pharmacy with service personnel for the supply of drugs / devices.	45	80.4	8	14.3	3	5.4
After the medicines and consumables are prepared within 3 or 4 st, the nurse and staff go to the pharmacy and the nurse receives the medicines in return for signature.	46	79.3	6	10.3	4	6.9
Incoming medicines are taken out of patients' special bags and placed in special cupboards for patients.	54	91.5	2	3.4	2	3.4
The nurse in charge of high-risk drugs receives from the pharmacy.	54	93.1	2	3.4	2	3.4
If there is any new drug missing on the change of request, new drug is entered into the system by the nurse.	50	96.2	1	1.9	1	1.9
Pharmacy officer is called and interviewed who is a attending doctor.	48	90.6	3	5.7	2	3.8
After the pharmacist arrives at the pharmacy and prepares the drug, staff and medicines are taken.	48	94.1	1	2.0	2	3.9
If the pharmacist cannot come, if the drug is available in a different ward, the nurse will contact the on-call nurse of that ward and have the drug taken by the staff.	42	93.3	2	4.4	1	2.2
The medicine taken from the other ward is supplied from the pharmacy and delivered to this ward the next day.	45	90.0	2	4.0	3	6.0
If the requested drug is not in the pharmacy stock, a physician is called and an external prescription is provided.	47	94.0	2	4.0	1	2.0
Ward consumables are requested weekly.	47	95.9	1	2.0	1	2.0
Weekly consumables are taken from the pharmacy and placed in the warehouse according to the warehouse order.	44	93.6	2	4.3	1	2.1

In the processes related to support services; laboratories, monitoring and blood centre, hospital pharmacy, 91% – 99.4% of the nurses stated that these activities, which consist of 30 items, were performed in the wards/units and 75.5%-98.2% found these activities necessary. However, 20.8% of the nurses found it unnecessary to call the physician to find out the type of X-ray, magnetic resonance, computerized tomography requested by physician and to enter the physician's request by the nurse into the module after learning the type and purpose of the diagnosis. Moreover, 14.3% of the nurses found it unnecessary to send all patient files to the pharmacy with the personnel for drug/device supply; 13.5% of the nurses found it unnecessary to enter the physician's laboratory requests and 11.8% of nurses found it unnecessary to enter blood and other assay samples into the laboratory module by the nurse (Table 3).

4.DISCUSSION

In this study, when the activities about the nursing work processes related to lean management were evaluated, it was determined that the majority of nurses did not have knowledge about the concept of lean hospital. The reason for this is that concept of lean is the new handling issues in the health services in Turkey and there is a limited number of studies.

In our study, regarding the need for lean approach, almost half of the nurses stated that the unit they work with needs to be partially lean. This may be due to the fact that the researchers informed the nurses before the data collection phase or that the nurses with undergraduate education supported this opinion more than the other nurses. Because in recent years these new approaches have been included in nursing bachelor's level programs.

When the views of nurses regarding the work processes related to patient admission and discharge, daily work flow, operating rooms and support services such as, laboratories, monitoring centre, blood centre and hospital pharmacy were evaluated, the majority of the nurses stated that most or all of the activities mentioned in this process were applied in the wards/units where they were located and that they found these activities necessary. In this direction, it was suggested that the majority of nurses perceived each task as self-assigned, were not clear about their duties or roles, or that job descriptions were not prepared for nursing roles. Therefore, it can be said that they cannot distinguish between necessary and unnecessary activities and also feel the responsibility of performing every task in order to prevent disruption of the work and to prevent the patients from being victims.

When the activities related to the patient admission process are evaluated, it is noteworthy that one out of four nurses rarely find it necessary to introduce themselves and the health care team to the patient and to assist the patient who is unable to meet his or her needs to wear and taking into the bed. According to the Nursing Regulations, taking the patient's history and orientation, helping to dress and undress the patient are among the nursing activities to be applied by the nursing decision (22). Therefore, this may be due to the fact that nurses do not know their job descriptions, do not care about the orientation of the patient to the ward, or are expected these activities, which have their own roles, from their patient's relatives.

During the patient admission process, one out of five nurses found it unnecessary to receive and record the patient's valuables, and one out of six nurses found it unnecessary to record the data in the care plan after evaluating the patient. This is due to the fact that these procedures are not seen as a priority procedure in special units such as emergency room, intensive care unit, operating room. In addition, although it is still performed in many clinics, it may be caused by the fact that in many public hospitals, hospitalization of valuable items should be handed over to the patient's relatives and it is stated that no responsibility will be taken. In addition, the preparation of a patient care plan after evaluation of the patient is one of the basic roles of nurses (22) and this approach should be performed by nurses in every unit of the hospital. However, the function of delivering and receiving the patient's belongings can be assigned to a custody unit or responsible personnel to handle these tasks. Thus, the nursing process can be leaned.

In the discharge process, only one quarter of the nurses stated that they rarely helped to prepare the patient during discharge, while one out of eight found this procedure unnecessary. In addition, one of the six nurses found it unnecessary to complete the discharge training form and to deliver a copy to the patient's relatives. Actually, discharging is an attempt made with the decision of nurse and physician (22). But, it takes a lot of time for the nurse to prepare the patient for discharge. However, it can be more useful to transfer the nurse's collection of the patient's belongings to the helper staff or the hotel services personnel. Besides, in the literature, it is mention that it would be useful the nurse devotes her/his time to patient education (23).

In the daily workflow process, one in ten nurses found it unnecessary for the patients to perform daily care practices and record them on the nurse observation form, for the morning shift nurse to prepare medicines and devices for evening shift treatments and to prepare nurse observation forms for use the next day. In the regulation, helping to feed the patient by mouth, feeding with spoon/glass, improving the quality of life, giving care and helping to meet physiological needs are the primary duties of the nurse (22-25). Although, the care needs of the patients are the duties of the nurses (24), it may be considered unnecessary because some of the patients meet these needs by themselves or their relatives. Nurses prepare drugs and devices in advance for the next shift, but this increases the workload of nurses and wastes time. Furthermore, this approach, which is not suitable for patient safety requires re-control of drugs and devices. Observation forms can be made available through the system and can be used at any time. In support of

our study findings, another study, it was stated that the undisclosed waste in daily work is 35%. (26). Kurutkan et al. (2014) has attributed the high amount of waste to inconsistencies in health services, unreliable delivery systems and unnecessary interruptions in their study (26). In Atkinson's study, the process time was reduced by 60% by eliminated 14 unnecessary steps with lean application (27, 28). Another study, supported by the Robert Wood Johnson Foundation, found that nurses were able to answer call bells, spend less time, and identify patient problems more quickly with improved workflow (29). According to Güleryüz, in the study of Wadhwa and Wadhwa, method cards were prepared and ensured that each work was performed in a standard way, so wastes and activities that did not create value were eliminated. Moreover, balance was achieved by using a single piece flow system. Thus, the number of patients waiting due to paperwork was reduced (27).

In the processes that the patient will go to the operation and come from operation, respectively, one out of eleven the nurses and one out of thirteenth of the nurses found it unnecessary to shave and to control of shaving at the pre-operative area and to deliver the patient to the operating room accompanied by the nurse. The reason why nurses find these procedures unnecessary may be due to their work in internal clinics or specialized units such as emergency, and intensive care units, or due to differences between wards/units and hospital policies. In addition, the shaving of the patients who will have an operation can be done by the hospital's barber. Therefore, this procedure can be excluded from the process and only the shaving control can be performed by the nurses or this duty can be transfer to a helper staff as specified in the Nursing Regulation (22).

In the process of laboratory and imaging centres, one out of eight nurses found it unnecessary to enter the physician's laboratory requests, blood and other assay samples into the system by the nurse. One fifth of the nurses found it unnecessary to call the physician to learn the type and purpose of imaging procedures such as x-ray and tomography, and then to enter the system by the nurse and one-tenth of the nurses found it unnecessary to send the patient to the imaging centres in a presence of nurses and staff. In the nursing regulation, the duty of the nurse regarding the laboratory process is not to enter the physician's request into the system (22). However, in this study, the nurses perform the requests for diagnostic procedures as if they were their own activities, not only the laboratory but also the physician's procedure, although these are physicians' duties. However, these procedures, which do not add value to nursing services and increase the workload, should be eliminated from the process.

In the pharmacy processes, approximately one out of seven of the nurses found it unnecessary to send all patient files to the pharmacy with the staff for the supply of drug/devices, going to the pharmacy after the preparation of drug and consumables by the nurse and staff and to receiving them in return for signature by the nurse. In this context, information systems and technology products can be utilized in order to reduce the workload of the nurses related to the pharmacy. For example, a PYXIS system integrated with the hospital information system ensures over-dispatch of drugs and return of unused medicines in clinics / units through automation, eliminating waste of drugs and eliminating unnecessary activities such as unnecessary transport, stock and unnecessary movement. In addition, the lean approach can be achieved in pharmacy processes by using process mapping technique. In a study conducted in a university hospital, the physician prepared the treatment plan digitally according to the process map of the pharmacy, the drugs coming to the pharmacy module were prepared on a patient basis, the drugs delivered to the clinic by the pharmacy staff, thus the mistakes for the patient safety were prevented and the burden of the cheaf nurse was reduced (30).

5. CONCLUSION

As a result, in this study which was defined the processes involving nursing activities, it was found that nurses were not aware of the lean approach and did not use it adequately in nursing care process. It was found that nurses thought some activities unnecessary although they were within the scope of their duties, authorities and responsibilities. However, it was determined that the nurses performed some activities and thought them necessary even though they were not covered by their duties. Eliminating unnecessary activities thanks to the lean approach it can be ensured that nurses can devote their time and energy to patient care and education.

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