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Storage and distribution of personal protective equipment in national health insurance patient services during the Covid-19 pandemic at Bahteramas regional public service agency hospital Southeast Sulawesi Province, Indonesia

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Abstract

The rate of transmission of the Covid-19 disease is very high so that it spreads very quickly throughout the world with very high morbidity and mortality rates. In an effort to handle Covid-19 at the Bahteramas Regional Public Service Agency (RPSA) Hospital, Southeast Sulawesi Province, it is necessary to have Personal Protective Equipment (PPE) for health workers to prevent cross-infection between patients and officers. The purpose of the study was to determine the storage and distribution of Personal Protective Equipment during the Covid-19 pandemic at the Bahteramas RPSA Hospital, Southeast Sulawesi Province. This type of qualitative research with a case study approach. The research was conducted at the Bahteramas RPSA Hospital, Southeast Sulawesi Province, Kendari City, with the reason that this hospital is a referral hospital for Covid-19 patient services. The informants in the study consisted of 2 regular informants and 5 key informants. Data was collected using observation, document review and in-depth interviews. Data analysis is done by matrix Content Analysis. The results showed that the process of storing PPE in the storage warehouse, during storage there are no obstacles found. The warehouse capacity is very sufficient for the storage and storage of PPE logistics supplies. The PPE storage is in accordance with the applicable SOP. There were no obstacles encountered when distributing PPE from logistics to health workers. Conclusion; The storage and distribution of PPE at the Bahteramas RPSA Hospital is considered quite good, because the storage of PPE in the pharmacy warehouse is in accordance with the applicable SOP. Meanwhile, the distribution of PPE to health workers is carried out through requests from each hospital service unit, according to the number of needs that will be used so that the needs of PPE in each service unit can be met properly.

Keywords: Storage; Distribution; Personal Protective Equipment; Covid-19

1. Introduction

Currently, the world's population is being shaken by the Corona Virus Disease (Covid-19) pandemic. Corona Virus Disease is a type of virus that originates from animals and is transmitted through animals and humans. Covid-19 is a new type of coronavirus found in humans in the Wuhan area of China, in December 2019. After its appearance in humans causing illness and death accompanied by its rapid spread throughout the world, the World Health Organization (WHO) officially declared the corona virus to be pandemic on March 11, 2020. The corona virus is very feared by the entire world population because until now there has not been found a cure for the virus.

Entering the third quarter of 2021, Indonesia is faced with an unsavory situation with the outbreak of Corona Virus Disease 2019 as a global pandemic that also threatens the safety of citizens' lives and damages the national economy.

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To anticipate the problem of the outbreak of the Covid-19 pandemic in Indonesia in March 2020, the government issued Government Regulation in Lieu of Law Number 1 of 2020 concerning State Financial Policy and Financial System Stability for handling the Covid-19 pandemic in order to face threats that endanger the national economy, and or financial system stability. The transmission of Covid-19 has spread to 223 countries in the world and caused infections in 90,759,370 people worldwide with a death toll of 1,963,169 people. The first finding of Covid-19 cases in Indonesia were 2 Depok residents, West Java, who were known to have a history of contact with Japanese citizens [1].

According to the data records of the Ministry of Health of the republic of Indonesia, the number of spread of the Covid-19 pandemic in Indonesia as of January 14, 2021, was 869,600 positive cases, 711,205 people had recovered, and 25,246 died. In the Southeast Sulawesi area, the number of cases of Covid-19 as of January 14, 2021, was found to be 8,639 positive cases, 7,305 people have recovered and 167 people have died. Meanwhile, at the Bahteramas Hospital, according to medical records, 72 cases of health workers exposed to COVID-19 were found.

Health workers who are placed in hospital health services are considered the spearhead in health services and have faced serious problems, many health workers have died in the service of Covid-19 cases. If you look at the CNN report data in Indonesia, the human rights organization, Amnesty international, it was recorded that on September 3, 2020 there were as many as 7000 health workers around the world who died due to Covid-19 infection. In Indonesia, if you look at the data from the Ministry of Health, on February 1, 2021, there were 684 health workers who died due to COVID-19 infection. In the Southeast Sulawesi Province, according to the records of the Health Office of the Southeast Sulawesi Provincial Health Office, as of January 31, 2021, there were 12 health workers who died from Covid-19.

Hospital pharmacy installation (HPI) is an installation in a hospital that manages medical equipment or consumable medical items starting from procurement, production, storage and distribution and is responsible for all pharmaceutical items circulating in the hospital for all parties in the hospital, both staff and patients. To carry out pharmaceutical duties and services, HPI has various functions that can be classified into non-clinical functions and clinical functions [2].

To increase vigilance and handling of the Covid-19 disease, the Ministry of Health of the Republic of Indonesia through the Decree of the Minister of Health Number HK.01.07/Menkes/104/2020 on February 4, 2020 has determined Covid-19 as a disease that can cause outbreaks and how to overcome it. In dealing with the covid-19 outbreak, the use of PPE for health workers is urgently needed in every hospital, especially hospitals that have been appointed as Covid-19 Referral Hospitals. So that the use of PPE for officers becomes a means of protection from the dangers of exposure or cross infection between patients and health workers in health services.

As stated in the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/Menkes/169/2020 concerning the Designation of Referral Hospitals for Handling Covid-19 as Certain Emerging Infectious Diseases, the government has designated as many as 132 hospitals in 34 provinces throughout Indonesia as hospitals. Referral for Covid-19 cases. Of the 132 existing referral hospitals, one of them is in Southeast Sulawesi Province, namely the Bahteramas RPSA Hospital, Southeast Sulawesi Province. In an effort to handle Covid-19 at the Bahteramas RPSA Hospital, it is very necessary to have sufficient PPE availability for health workers in order to provide protection from the dangers of work accident risks and break the chain of disease transmission between patients and health workers at the hospital. The availability of complete PPE is very much needed by health workers to provide treatment for Covid-19 patients, considering that the Bahteramas RPSA Hospital is a Referral Hospital for Covid-19 cases.

In order to achieve the effectiveness of the use of PPE for health workers at the Bahteramas RPSA Hospital, an adequate PPE storage area is needed, accompanied by good distribution activities to support the achievement of optimal and satisfactory health services for health service users. The purpose of this study was to determine the storage and distribution of Personal Protective Equipment during the COVID-19 pandemic at the Bahteramas RPSA Hospital, Southeast Sulawesi Province.

2. Material and methods

Type of research used is qualitative with a case study approach, which aims to research and find out specifically about all forms of implementation of management processes in the storage and distribution of PPE during the Covid-19 pandemic. The research was conducted at the Bahteramas RPSA Hospital, Southeast Sulawesi Province, with the reason that this hospital is a referral centre for Covid-19 patient services in Southeast Sulawesi. The research informants consisted of 2 regular informants and 5 key informants. The criteria for selecting informants are those who know the incident, have rational arguments, feel the impact of the incident, are directly involved with the incident, have sufficient time, and are able to convey information well. The selection of informants can be based on the depth of understanding or experience of the informants. Collecting data using observation, and in-depth interviews. Data analysis was carried

out by means of matrix *content analysis* derived from data collected from the data collection process, namely recording & note taking, literature review, interviews, and participation [3].

3. Results

According to [4] Storage is an activity and effort to manage the organization and arrangement of inventory items in the storage room. Meanwhile, according to [5], distribution is logistics management related to the distribution and delivery of logistics to units/organizational units that need it in accordance with a predetermined work system [3]. In hospitals, this function is the function of receiving, storing and distributing PPE at the Bahteramas RPSA Hospital, to be used by health workers as PPE users at the Bahteramas RPSA Hospital.

Based on the results of in-depth interviews, it was found that in the process of storing PPE in the storage warehouse through the stages of checking invoices for goods received, incoming goods have a stock card and function as a record of the entry and exit of goods. Completeness checked in the form of an invoice containing goods such as the name of the goods, quantity, physical condition, *expired date*, and seal. Checking of goods is carried out every month by looking at the suitability between the physical number of goods and the amount listed on the stock card. During storage, no problems were found in the storage of PPE. The warehouse capacity is very sufficient for the storage and storage of PPE logistics supplies. The PPE storage is in accordance with the applicable SOP, as stated by the following informants;

- „ First, the PPE comes in and it is received from the goods receipt department and then checked. In checking the invoice, it is adjusted to the goods, after that after being checked at the reception, we continue to give stock of the goods..., Until now there are none because the place is also big and there are also pallets,, (Ordinary Informant, SLH).
- „ Recorded on the card stock. So each item has a card stock. It is calculated every month whether the physical number of goods is the same as those listed on the stock card, so the outgoing goods are written down or the incoming goods are written on the stock card,, (Key Informant, NEH).

Based on the results of in-depth interviews, it was found that the process of distributing PPE to health workers on duty is carried out through requests submitted once a week every Monday, officers from each unit submit requests for PPE needs, then on Tuesday goods/drugs/PPE can be taken directly to the logistics section of the installation. Pharmacy. However, if the requested PPE is not sufficient for a week, the officer can request it again. When using PPE, the Pharmacy Installation will check to ensure the suitability between the number of requests for PPE and the number of officers, as stated by the following informants;

- ... So, the system covers once a week. So every Monday, the room inputs requests here (Pharmaceutical Installation), tomorrow they just have to serve the goods they take according to the number of requests,, (Key Informant, NEH).
- ... So, they have already planned how much noodles they need, after all, they need it for a week. Even though in a week they don't have enough request, he just needs to contact the logistics team, they say there is a need, said we ran out of medicine, we ran out of goods, so we just have to prepare it even though it's not on request day ,, (Ordinary Informant, SLH).
- , but here we also filter. We don't immediately give what they write here, we usually ask again, for example, like hazmat PPE clothes, when we ask again the number of officers, how many people, then how many times does the doctor come in or the nurse in a day how many times to check the patient has been counted as an emergency, then we count the number day the number of officers who come in, then that number is given. Masks are still being counted, they are still being rationed,, (Key Informant, NEH).
- ... We distribute the PPE every week, so Monday, we have included the PPE, Tuesday, the goods have been taken. So every week regularly for PPE request,, (Ordinary Informant, AA).

Based on the results of in-depth interviews, it was found that there were no obstacles encountered when distributing PPE from logistics to health workers, as stated by the following informants;

- „ Nothing really,, (Ordinary Informant, S)
- „ There are no obstacles, it's safe, it's safe,, (Ordinary Informant, M)
- „ For there are no obstacles ,, (Ordinary Informant, N)
- „ Thank God there is none ,, (Ordinary Informant, AA)

4. Discussion

The Hospital Logistics Recording System is a logistical documentation activity with the aim of monitoring incoming and outgoing logistics transactions for supplies within the Hospital Logistics Installation. PPE recording system in the logistics installation of the Bahteramas RPSA Hospital using a Stock Card. Logistics stock card is a record of logistics inventory mutations in hospitals. Each stock card sheet is only intended to record mutation data for one type of PPE logistics. The logistics officer will record every logistical mutation. Each incoming item has a stock card to record the entry and exit of the item. Filling of stock cards is done routinely every time there is a mutation of PPE logistics and stock cards will be placed next to each PPE logistics item. Every month the logistics officer will check the suitability of the physical number of goods and the amount listed on the stock card, with the aim of ensuring that the documentation does not lose the goods. In the storage of hospital PPE logistics supplies, using the First In First Out method, i.e. PPE logistics that arrive earlier will be used or distributed earlier as well.

So far, no obstacles have been found in the storage of PPE supplies in the logistics warehouse of the Bahteramas RPSA Hospital. The volume of the logistics storage warehouse is sufficient to accommodate PPE logistics supplies at the Bahteramas RPSA Hospital. The procedure for storing PPE supplies is carried out in accordance with the Standard Operating Procedures established by the hospital. Placement of the direction of the flow of receipts and expenditures of logistics supplies, warehouse space is designed by paying attention to the straight-line traffic flow system in the storage room. In the PPE inventory storage room using a one-story system, PPE is placed on a pallet. The placement of PPE supplies is sufficient to fill the place, PPE storage is placed in boxes, the stock of PPE supplies in large packages is placed on pallets in a neat and orderly manner. To maintain the logistical quality of PPE in the storage warehouse, the hospital completes room facilities in the form of air conditioning.

One of the most important factors that need to be considered in storage is the size of the room, placement of shelves, length of storage time, air temperature, humidity, including air circulation in the room. Air circulation is one of the important factors in designing warehouse buildings. Good circulation will maintain air humidity, exchange air at room temperature, avoid cold temperatures thereby maximizing the life of PPE logistics so that it can extend and improve the working conditions of officers when they are in the storage room. The availability of adequate air ventilation through windows, doors, and ventilation installed on the roof of the warehouse will supply sufficient air in the warehouse room. Likewise, it is also equipped with fire extinguishers as a standard for regulating storage space, the Director General of Pharmaceutical and Medical Devices in 2010 where the spatial requirements in the warehouse must have fire prevention.

Warehouse as a supporting facility for health services is provided with the aim of storing goods as a buffer for requests so that requests can be fulfilled. In addition, the warehouse also functions as a point of delivery of goods where all goods are received and sent as quickly, effectively and efficiently as possible. The function of the storage warehouse is as a place to store inventory of goods so that the goods remain safe and maintain their quality until the goods are ready for use [7].

In every hospital, warehouse is the main requirement in service, because in addition to the completeness of services, it is also a place to store goods, maintain goods security and facilitate the control of hospital logistics. Warehousing activities must have a good storage system in order to support the smooth production process and warehousing activities. However, a warehouse can be said to be effective and efficient, it can be seen in various aspects, one of which is the storage of materials or products. The air condition in the warehouse for storing PPE supplies using pallets also has stock card replenishment carried out regularly, that is, every time the PPE mutation occurs and the stock card is placed next to each PPE item. This is in accordance with Minister of Health regulations No. 72 of 2016 [7].

Distribution or distribution is an activity or business to manage the movement of goods from one place to another. Accuracy and strict discipline in handling distribution problems are very important elements to achieve the expected goals [8]. The purpose of distributing PPE to health workers is intended to carry out the distribution of PPE from logistics warehouses to hospital health service units so that every service provided with PPE is always available in sufficient condition, the quantity, type, and quality of goods are maintained economically and effectively when used.

Distribution is the activity of distributing goods according to demand, on time, in the right quantity and according to specifications. Distribution is an activity to distribute pharmaceutical supplies in hospitals for individual services in the therapeutic process. The purpose of the distribution is to ensure the availability of pharmaceutical supplies in health care units in a timely manner, in the right type and quantity. Inpatients and outpatients as well as to support medical services [7].

The implementation of PPE logistics distribution in hospitals is classified based on the request of each service unit in the hospital. The PPE logistics distribution system is categorized according to a centralized service system and a distributed service system. A centralized service system is a PPE logistic distribution system centre on a place that has been determined by the hospital, where distribution is carried out if there is a request for PPE from each hospital health service unit. In the centralized distribution method, all PPE logistics needs for each service unit are supplied directly from the hospital PPE logistics service centre. A distributed service system where the procurement of PPE logistics needs for each hospital service unit is carried out by each service unit.

The distribution of PPE is carried out from the storage warehouse to each hospital service unit/room. The process of distributing PPE to health service providers is based on requests for PPE needs of each service unit, which are submitted once a week to the hospital logistics department. If the availability of PPE is not sufficient for a week, then the health officer can re-submit to the hospital logistics. Before the distribution of PPE is carried out, the hospital logistics officer will carry out an inspection to ensure the suitability between the number of requests for PPE and the number of health workers using PPE.

The results of this study support previous research conducted by [10] saying that the recipient of pharmaceutical supplies at the RSDC warehouse is carried out by the responsible officer, in this case the head of the warehouse whose profession is a pharmacist. Also the completeness is checked such as the name of the item, quantity, physical condition, expiration date, and seal. Research [11] said that stock cards are provided per drug item and are placed next to the drug. In the drug stock card column there are names of goods, packaging, source of origin of pharmaceutical supplies or to whom pharmaceutical supplies are sent, batch number, expiration date, date of receipt, date of issuance, amount of receipt, amount of expenditure, remaining stock. Research [12] said that before distribution, each unit/depot makes and delivers the request sheet to the pharmacy warehouse and then it is checked first by the officer to ensure the availability of the requested drugs, medical devices and medical consumables, after which preparations are made according to the requirements. Request sheets/requests for supplies are then distributed to each unit/depot.

The results of this study are in line with research [2] which states that at the Wisma Atlet Covid Emergency Hospital, the warehouse location for PPE items is in tower 3. Because this is categorized as an emergency warehouse, there is no special handling. The warehouse facilities only have piles of PPE items that have been provided with pallets and the room in the warehouse is also available with air conditioning in order to maintain the quality of the PPE items. And the warehouse for goods storage also does not have special handling because this includes an emergency warehouse. Research [13] says that in recording the entry and exit of drugs, the head of the installation is responsible for this. Recording is done using the drug stock card contained in each drug. All drugs that come out or enter, the date will be recorded as well as the remaining stock of the drug. Research [14] said that the process of distributing drugs at the Pharmacy Installation of Leuwiliang Hospital according to the person in charge of the pharmacy warehouse, namely the pharmacy warehouse officer received a request file from the pharmacy depot, then the warehouse officer examined and checked the drugs to be distributed.

These findings are in line with research [15] which states that the method of distributing drugs to meet drug needs in each service unit, both inpatient and outpatient as well as in the emergency department, based on the results of interviews with informants, it is known that drug distribution is to meet drug needs in each service unit, both inpatient and outpatient. And outpatient and emergency department, which is making request or requests and then taking them to the warehouse. Then the warehouse makes notes and the warehouse staff full fills the drug needs in each service unit. Research [16] said that the distribution process based on a request letter from the pharmacy depot was handed over to the pharmacy warehouse. From the warehouse the goods are delivered to the pharmacy / pharmacy depot. Goods are received by assistant Apothecary, checked for type, quantity, expiration date based on the request letter and then recorded in the goods receipt book.

5. Conclusion

Storage and distribution of PPE at the Bahteramas RPSA Hospital is considered quite good, because the storage of PPE in the pharmacy warehouse is in accordance with the applicable SOP. Meanwhile, the distribution of PPE to health workers is carried out through requests from each hospital service unit, according to the number of needs that will be used so that the needs of PPE in each service unit can be met properly.

Compliance with ethical standards

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Author contribution

Suhadi, Niken Indah Prastika, Rahman, and Adrian Tawai as designers, implementers of research and preparation of reports. Suhadi, Adrian Tawai as a reviewer of the report manuscript. Niken Indah Prastika, Rahman as data collector, analyzer and interpreter of data. All authors read and agree to the Final Report.

Disclosure of conflict of interest

All authors state that this research was conducted without any conflict of interest.

Statement of informed consent

All informants/respondents involved in this study have stated their consent as informants/respondents to be interviewed and provided information/information in accordance with research needs.

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