



Analysis of Inpatient Linen Management in Hospital Isolation Room in Indonesia: A Review

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ABSTRACT

Linen handling activities are a very important handling activity carried out in hospitals. The thing that can minimize the risk of distribution of linen is to carry out proper handling according to standards. If the handling is carried out properly, the risk of spreading microorganisms to activities, staff, and the environment can be carried out and minimized. The purpose of writing this article is to find out the analysis of inpatient linen management in isolation rooms in various hospitals in Indonesia. The method used in writing this article is a qualitative method with the strategy used is a literature study on the topic of analysis of linen management in hospital isolation rooms in Indonesia. The results of the literature from various sources found that hospitals in Indonesia had set standards for linen management to prevent transmission. However, linen management in various hospitals in Indonesia, in general, has not been able to run optimally and has not met the applicable standards. This can be seen from the various stages of handling linen that does not meet the standards starting from the stages of separation, reception, processing, washing, and storage.

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ABSTRAK

Kegiatan penanganan linen merupakan sebuah kegiatan penanganan yang sangat penting dilakukan di rumah sakit. Hal yang dapat meminimalisir risiko penularan dari linen yaitu dengan melaksanakan penanganan yang tepat sesuai dengan standar. Jika kegiatan penanganan dilakukan dengan tepat, maka risiko penularan mikroorganisme pada pasien, petugas serta lingkungan dapat dicegah dan diminimalisir. Tujuan penulisan artikel ini yaitu untuk mengetahui analisis pengelolaan linen rawat inap ruang isolasi di berbagai rumah sakit di Indonesia. Metode yang digunakan dalam penulisan artikel ini yaitu metode kualitatif dengan strategi yang digunakan adalah studi literatur dengan topic analisis pengelolaan linen rawat inap ruang isolasi rumah sakit di Indonesia. Hasil tinjauan pustaka dari berbagai sumber yang ditemukan menyatakan bahwa rumah sakit di Indonesia sudah menetapkan standar pengelolaan linen untuk mencegah risiko penularan. Namun, pengelolaan linen di berbagai rumah sakit di Indonesia secara garis besar belum dapat berjalan dengan maksimal dan belum memenuhi standar ketentuan yang berlaku. Hal ini dapat dilihat dari berbagai tahap kegiatan penanganan linen yang belum memenuhi standar mulai dari tahap pemisahan, penerimaan, pengangkutan, pencucian dan penyimpanan.

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INTRODUCTION

The hospital states that the hospital is a health service institution that provides complete individual health services that provide inpatient, outpatient, and emergency services. In hospitals, one of the efforts to reduce the incidence of nosocomial infections is to carry out comprehensive linen management. The management in question includes collection, sorting, washing, storage, and distribution to rooms in the hospital. Not only management that focuses on linen quality, in this case, the human resources who manage it also need to have a comprehensive understanding of proper linen management. This is useful to achieve the goal of ensuring the safety and health of officers which in turn will affect the quality of linen management. (Aini, 2013)

The hospital laundry installation is responsible for receiving and distributing all linens that require clean conditions, free from stains/dirt and microorganisms that cause infection, dry, neat, intact, and ready to use. Quality hospital linen services for patients are clean and smell good (physical linen), and healthy (free from pathogenic microorganisms). Quality hospital linen services can support patient satisfaction during hospitalization. Hospital laundry units as one of the supporting elements of health services that provide patient linen services in hospitals need to be managed properly and correctly. Hospital laundry is a place where the hospital linen washing process is carried out to prevent and control infection (PPI) in hospitals. (Kementerian Kesehatan RI, 2017)

In the Regulation of the Minister of Health of the Republic of Indonesia Number 7 of 2019 concerning Hospital Environmental Health, linen is one of the needs of patients in hospitals that can have an impact on comfort and health insurance. Good hospital linen management from the collection, reception, washing distribution, transportation, and storage can support infection prevention and control (PPI) in hospitals. (Kementerian Kesehatan RI, 2019)

In the provision of quality linen services (infectious and non-infectious linen) in hospitals and other quality health

care facilities, it is necessary to pay attention to linen management, both from human resource management, process management and linen circulation management. Hospital linen management is expected to meet good linen standards so that it can support hospital services properly. (Kementerian Kesehatan RI, 2016)

The activities of handling dirty clothes and handling linen are very important handling activities carried out in hospitals. Linen that has been contaminated with pathogenic microorganisms will have a high risk of transmission. The thing that can minimize the risk of transmission is by carrying out appropriate handling according to standards. If handling activities are carried out properly, the risk of transmitting microorganisms to patients, staff and the environment can be prevented and minimized. (Singh Dara et al, 2009) The linen management activities in the hospital are not only functioned as an effort to prevent and control infectious diseases, this management activity is also functioned to create a good image for the hospital. The patients and their caring families will feel comfortable when being treated at the hospital if the linen provided is clean, tidy, fragrant, not dirty and not torn. This in turn will have an impact on patient satisfaction. (Singh Dara et al, 2009) However, in reality there are still significant obstacles in the management of linen in hospitals. The purpose of writing this article is to find out the analysis of inpatient linen management in isolation rooms in various hospitals in Indonesia.

METHOD

This study uses a review method with the type of narrative review. The narrative review aims to identify the impacts of implementing HB-HTA in hospitals. The reference source in making these scientific articles are obtained from several databases and there are no standards or protocols in the collection of article narrative reviews. Therefore, article screenings as show in figure 1.

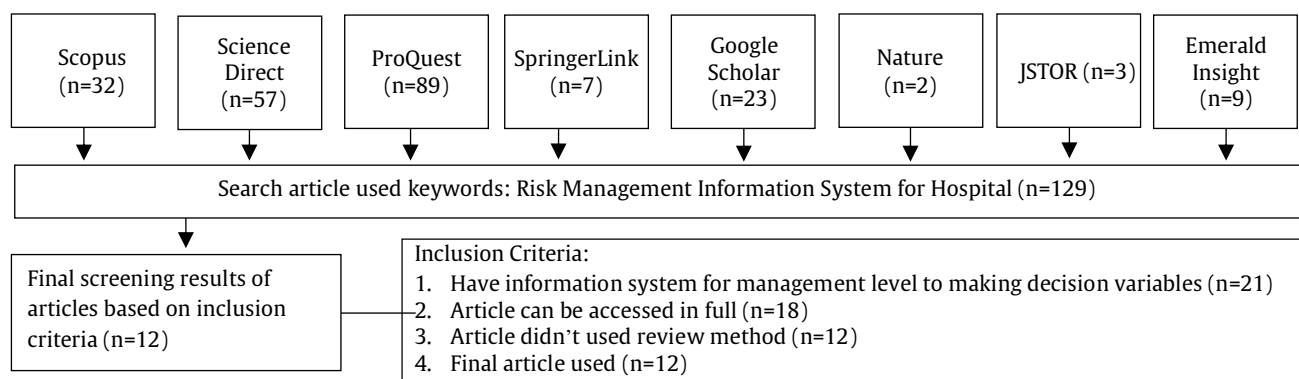


Figure 1. Flow Chart Screening Article

RESULTS AND DISCUSSION

The article screening process resulted in 12 articles that were used as a review study to determine linen management in hospital isolation rooms in Indonesia. The year the article was published is between 2013-2021 with case studies in several Indonesian hospitals. A more detailed description is presented in table 1.

Implementation of prevention and control of nosocomial infections in hospitals through linen management must be carried out according to standards. The standards are: (a) Health care facilities are required to have standard operating procedures related to linen management (b) Health workers who are in direct contact with linen must wear personal protective equipment (c) Dirty linen and linen contaminated with body fluids must be separated. (d) Health care workers

must minimize the handling of soiled linen to prevent contamination in the air and contamination to personnel who come into direct contact with linen. (e) Sticky dirt must be removed (f) Use detergent and 0.5% chlorine to clean infectious body fluids stuck to linen (g) Linen that has been contaminated with body fluids and blood must be wrapped,

placed in a yellow bag, and transported carefully so as not to leak (h) Contaminated linen and soiled linen must be separated from clean linen when in the laundry (i) Wash and dry linen must be in the laundry room (Arifin, Anisa. Safri. Ernawaty, 2019).

Table 1.
Literature Review Related to Analysis of Inpatient Linen Management in Hospital Isolation Rooms in Indonesia

No.	Journal Title	Authors	Year	Result
1.	Analysis of linen management at the laundry installation of Ibnu Sina Islamic Hospital Pekanbaru in 2018	Mukhtar, H., Nurmaimun, Yunita, J., Asfeni, & Djuhaeni, H	2018	Constraints on linen management at Ibnu Sina Hospital: lack of linen, training provided to officers is still not optimal, handling machine damage also takes a long time, there is no tool to weigh dirty linen, services have not been carried out regularly, there is no PPE SOP, the activity of weighing dirty linen has not been carried out, and the linen color selection activity has not been carried out
2	Adjustment of the Management of Laundry and Linen Infrastructure in the CSSD and Laundry Installation of the Orthopedic Hospital Prof. Dr. R. Soeharso Surakarta Against the Decree of the Minister of Health RI NO. 1204/MENKES/SK/X/2004.	DR, M. N.	2013	Inappropriate linen management in the Orthopedic Hospital Prof. Dr. R. Soeharso Surakarta: unavailability of room to put dirty linen, no special room for dirty and clean strollers, incomplete PPE, no special room for changing employee clothes and dirty linen inflow is still the same as the stroller exit for linen clean.
3	Laundry Linen Management at Bhayangkara Tebing-High Hospital, North Sumatra in 2021.	Bethesda, R. O	2021	Inconsistency in linen management at Bhayangkara Tebing Tinggi Hospital: at the stage of linen washing, linen distribution and linen transportation, it has not been carried out in accordance with the standards of the Minister of Health Regulation no. 7 Years 2019
4	Study of linen handling process at Emanuel Hospital Banjarnegara in 2015	Legowati, E., & Subagiyo, A.	2015	There are several obstacles in the linen handling activities at Emanuel Hospital, including because they still use the same trolley to carry infectious and non-infectious linen even though the bags have been separated.
5	Linen management at Siti Khodijah Hospital Sidoarjo in 2016.	Safitri, N., Nerawati, D., & Nurmawanti, D.	2016	Based on the results of the study, the linen management activities located at Siti Khodijah Hospital were not in accordance with predetermined standards. Linen management activities in this hospital get a score of 70%.
6	Analysis of Linen Management in the Laundry Unit of Hospital X Pematang Siantar in 2019	Damanik, R. I. P. S.	2020	Incompatibility of linen management in hospitals at the stage of linen collection, linen washing, linen ironing, linen storage and linen transportation.
7	Process Flow Analysis of Dirty Linen Management in Laundry Installation at BLUD Sekarwangi Hospital	Agustiani, D.	2019	Inconsistencies in the management of linen at the Sekarwangi hospital are found in the stages of separation, reception, transportation, washing and storage
8	Sanitation study on linen management at PKU Muhammadiyah Gombong Hospital, Kebumen Regency in 2015	Prasetyo, Y. D., & Marsum, M.	2016	Inappropriate linen management in PKU Muhammadiyah Gombong Hospital, including the use of manual type irons, no separator between infectious and non-infectious linen on dirty trolleys and no cover
9	Analysis of linen management in the inpatient installation of Permata Bunda Purwodadi Hospital	Aini et al.	2013	Linen service activities at Permata Bunda Hospital have several shortcomings, including the linen ordering process, linen procurement, linen distribution, service, linen control, inventory and coding. However, linen maintenance activities have been carried out optimally.
10	Regional hospital linen management dr. Adnaan Wd Payakumbuh West Sumatra.	Darwel, A., & Hidayanti, R.	2019	Linen management activities in RSUD dr. Most of Wd Payakumbuh's Adnaans have met the standards that have been set
11	Minimum service standards at Tugurejo Hospital Province of Central Java,	Amalia et al	2019	Linen management activities at Tugurejo Hospital have several shortcomings in the aspects of input, process and output.
12	Overview of Linen Management at Sanglah Central Hospital Denpasar	Gabur, I	2018	The results showed that the management of linen in Sanglah Hospital had been carried out in accordance with applicable regulations.

The following will describe how the problems or constraints or deficiencies that exist in various hospitals in Indonesia are related to linen management. Research no. 1 states that the management of linen contained in RSI Ibn Sina has various obstacles. The obstacles include the lack of linen. In addition, the training provided to officers is still not optimal, handling machine damage also takes quite a long time, there are no facilities and infrastructure for weighing dirty linen, services have not been carried out regularly, there is no PPE sop, the activities for weighing dirty linen have not been carried out, and the linen color selection activity has not yet been implemented. Seeing the obstacles that occur, it is necessary to pay more in-depth attention to the management of linen in the installation of RSI Ibnu Sina Pekanbaru which is adjusted to the standard. (Mukhtar, Yunita, & Djuhaeni, 18AD)

Research no. 2 shows that the linen management activities at the Orthopedic Hospital Prof. Dr. R. Soeharso Surakarta have not fully complied with the standards that have been set. The standard used in this hospital is the Decree of the Minister of Health of the Republic of Indonesia No. 1204/Menkes/SK/X/2004. This discrepancy can be seen in several things including the unavailability of a special room to put dirty linen, the absence of a special room for dirty and clean strollers, the incomplete supply of masks, aprons, and gloves so that some officers do not use complete PPE, in hospitals There is also no special room for changing employees' clothes. The last discrepancy is that the inlet flow for dirty linen is still the same as the stroller outlet for clean linen. (DR, 2013)

Research number 3 states that the linen management activities at the Bhayankara Tebing Tinggi Hospital installation have been carried out following the applicable standards. The standards are Minister of Health Regulation No. 7 of 2019. This conformity can be seen in the stages of collecting linen, receiving linen, drying, and storing linen. However, at the linen washing stage, linen distribution and linen transportation have not been carried out following the standards of the Minister of Health Regulation no. 7 of 2019. The linen washing activity is not up to standard because when sorting the officers put dirty linen on the floor, besides that the officers still use manual irons and there is no special closed linen closet. The management of the distribution and transportation stage of linen does not meet the standards because it does not use a trolley when distributing linen. The hospital needs to provide training, especially to officers who are in direct contact with linen to avoid contracting infections due to handling linen that is not up to standard. (Agustiani, 2019)

Research no. 4 explained that the handling of linen in the Emanuel Hospital Banjarnegara got a score of 70%. This value belongs to the fairly good category. Linen handling activities in this hospital are based on the Decree of the Minister of Health of the Republic of Indonesia n. 1204/MENKES/SK/X/2004. This activity starts from the stage of linen collection, linen transportation, linen reception, linen cleaning, linen drying, linen ironing, linen storage, linen distribution, linen sterilization, linen replacement clean linen installation. Based on the results of the microbiological examination of spores in *Bacillus* sp. which is found on the hospital bed sheet is 0.62 inc2, on the pillowcase is 19.22 inc2, and on the bolster cover is 4.96% and on the blanket is 127.72 inc2. In this hospital, there are several obstacles in linen handling activities, including because they still use the same trolley to carry infectious and non-infectious linen even though the bags have been separated. (Legowati & Subagyo, 2015)

Research no. 5 states that the linen management activities in the laundry unit of the Siti Khodijah Hospital cannot currently be carried out according to regulations. Linen management activities in this hospital get a score of 70%. As an evaluation material, it is recommended that the hospital conduct linen management training activities intended for workers who are directly related to linen, the hospital is also expected to make job descriptions for workers and carry out supervisory activities on officer compliance with predetermined SOPs. Finally, officers are required to carry out a physical examination and maintain the cleanliness of clean linen during the distribution process. (Safitri, Nerawati, & Nurmayanti, 2016)

Research no. 6 shows that the linen management activities in the laundry unit of RS X have adjusted to the linen management standards. The standard used in this hospital is Permenkes RI No. 7 of 2019. This conformity can be seen from the activities of receiving linen, drying linen and distributing linen. However, at the stage of linen collection, linen washing, linen ironing, linen storage and linen transportation, it was not in accordance with the established standards. This discrepancy can be seen from the incompleteness of facilities and infrastructure, such as the absence of a cleaning tool room, a special room for linen trains, a special room for ironing, a sink, a special room for sewing, a special room for washing infectious linen and non-infectious linen, an intermediate space for transit in and out. linen handling officers, the absence of disinfectants and tools and the absence of Security Data Information (MSDS) on chemicals. The X Hospital needs to carry out stricter monitoring for linen handling officers, this is so that workers can carry out linen handling activities according to established standards and avoid and prevent infection due to unclean linen. (Damanik R I P S, 2020)

Research no. 7 states that linen management at Sekarwangi Hospital is still experiencing various obstacles including the lack of workers, the application of hygiene and sanitation, and the incomplete facilities and infrastructure provided. At the stage of collecting, receiving, and transporting linen, the hospital has not separated non-infectious and infectious linen and has not recorded any activities. At the linen washing stage, this hospital does not provide weighing equipment and there is an open cupboard at the linen storage stage. (Agustiani, 2019)

Research no. 8 regarding linen management, namely at PKU Muhammadiyah Gombong Hospital. There were problems, among others, with the use of manual type irons due to damage to the iron with the provisions of 120°C. And on the dirty linen trolley, there is no separator between infectious and non-infectious linen, then there is no cover (Y.D. & Marsum, 2016)

Research no. 9 states that the management of linen at Permata Bunda Hospital has not been able to run optimally. This can be seen from several things. Among them are damaged linen and some are missing. In addition, there is no special officer who handles linen orders. The linen procurement process also does not have a standard. However, the linen maintenance process at this hospital has been running according to procedures. The distribution of linen has not been carried out properly because the distribution room is separated due to the presence of a road. The linen service activities at Permata Bunda Hospital have not run optimally because the linen is not regularly changed every day. Linen inventory control activities cannot be carried out optimally because of the lack of calculating linen needs and still using the standard 3 x number of beds. Inventory and coding activities for linen have not run optimally because the

recording is not carried out in detail. The hospital is recommended to calculate the need for linen according to the number of patient beds with 3 linens available in each room. In addition, the hospital also needs to make standard linen management procedures so that all staff can follow it. (Aini, 2013a)

Research no. 10 shows that the management of linen in RSUD dr. Adnaan WD Payakumbuh has met the standard with an overall score of 80%. The process of collecting, receiving, washing, and distributing linen received a score of 100%, and the storage process received a score of 80%. These results indicate that most of the linen management in this hospital has complied with the standards. (Darwel, A., & Hidayanti, R, 2019) Research no. 11 stated that the linen management at Tugurejo Hospital had several shortcomings in the aspects of input, process, and output. In the input aspect, this hospital is short of manpower and the workers who work have never received training in linen management. In the process aspect, linen management is constrained by the linen control section. In the aspect of output, the availability of linen is still often lacking. To overcome this, the hospital is advised to increase the number of workers in the laundry department, conduct labor training, improve the management process according to standards, improve coordination between the head of the room and laundry employees related to linen recording, linen reporting, and linen control by holding meetings which are done regularly. (Amalia et al, 2019)

Lastly, research no. 12 shows that the management of linen contained in Sanglah Hospital has been carried out following applicable regulations. The provisions are contained in the Decree of the Minister of Health of the Republic of Indonesia No. 144/Menkes/X/2004 in handling dirty linen and clean linen. However, the use of personal protective equipment, drying and ironing processes, as well as packaging, are not following the applicable standards. (Gabur, 2018)

LIMITATION OF THE STUDY

The limitation in this literature review study is that the author has not fully explained thoroughly or comprehensively related to the details of linen handling problems in various hospitals in Indonesia and the handling efforts.

CONCLUSIONS AND SUGGESTION

The results of a literature review from various sources found that hospitals in Indonesia had established linen management standards to prevent the risk of transmission. However, linen management in various hospitals in Indonesia, in general, has not been able to run optimally and has not met the stipulated standards. This can be seen from the various stages of linen handling activities that do not meet the standards, starting from the stages of separation, reception, transportation, washing, and storage.

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Conflict of Interest Statement

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