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ANALYSIS OF TOTAL PLATE COUNT (TPC) OF GERMS ON WALLS AND FLOORS OFTREATMENT ROOM BASED ON HOSPITAL TYPE IN EAST JAVA AND ITS IMPACT ON THE ENVIRONMENT AND HEALTH IN 2019

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ABSTRACT-- *Hospitals, aside from being a health service facility, can also be a place for transmission of infectious diseases that can affect health problems. One sign of transmission of nosocomial infection is high number of germs on the walls and floors in treatment room. This can result in transmission of nosocomial infections by patients, medical and non-medical staffs and visitors from the treatment room.To analyze the total plate count (TPC) of germs on the walls and floors of treatment room by hospital type in East Java and its impact on the environment and health in 2019 This type of research was a quantitative study with cross sectional design, using data from the test of the total number of germs on the walls and floors of hospital treatment room by BBTKLPP Surabaya. The data were processed with statistical techniques and analyzed by descriptive and cross tabulation (crosstab The TPC requirements for walls and floors germs according to the regulations is 5-10 CFU/cm^2 . The results showed total number of germs on the walls and floors in the treatment room as many as 83.3% of hospitals fulfilled the requirements and as many as 16.7% of the hospitals did not.Type B and C hospitalsthat did not fulfilled the requirements, 16,67% type B and 28.57% of type C. TPC germs on the walls and the floors of treatmentroom that didnt fulfilled the requirements, the highest, were in hospitals with type C. After analysis, there was a weak relationship between the TPC of germs on the walls and floorsand hospital type (coefficient contingency = 0.2 58), which meantthat a good type of hospital didnot guarantee a small TPC of germs. The total plate count of germs on floors and walls of patient treatment rooms in hospitals throughout East Java the majority were still below the standard quality in accordance with the Regulation of Health Minister RI Number 7 Year 2019 concerning Hospital Environmental Health which is equal to 5-10 CFU/cm^2. But there were still some who over the standard quality that has been set, so the manager of the hospital should be more supervising in terms of hygiene and sanitation in the treatment room.*

Keywords--*hospital, total plate count of germs, treatment room.*

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I. BACKGROUND

Hospital is the most important part in medical service organization that functions to provide curative and preventive health services to the surrounding community and their environment. Hospital activities can certainly have both positive and negative effects. The hospital is also a medical service institution that will provide medical services for all types of diseases including infectious diseases (1). Hospital is a place where sick people are treated and placed very close. In this place, patients get therapy and treatment to get well. However, the hospital, in addition to seeking healing, is also a place for various kinds of diseases that come from patients and from visitors. This disease germs can live and develop in a hospital environment, such as: air, water, floor, food and medical and non-medical objects (2).

Infection that occurs in hospitals is also called nosocomial infection or *Hospital Acquired Infections* (HAI's). HAI's is a serious problem for public health. HAI's is an infection that patient gets during treatment procedures and medical treatment in health care facility after 48 hours and after ≤30 days after leaving the health care facility (3). Based on the source of infection, the infection can come from the community or from the hospital. Transmission of hospital infectious diseases with a broader understanding, namely the incidence of infection not only comes from the hospital, but also from other health care facilities. Infection is not limited to patients but can also originated from health workers and visitors who were infected while in the health care facility environment (4). Nosocomial infections can be caused by any organisms but few organisms are particularly responsible for hospital-acquired infections (5).

According to *World Health Organization* (WHO) data, nosocomial infections cause 1.4 million deaths per day worldwide (6). Continuous hospital-wide surveillance for nosocomial infection (NI) was begun at the opening of a new 250 bed community hospital in Alzira, Spain (7). According to data from the Health Ministry, in Indonesia transmission of nosocomial infections varies in hospital types. The results of a study conducted by the Indonesian Health Ministry in 2016 showed that the proportion of nosocomial infections in government hospitals with 1,527 patients out of 160,417 (55.1%) patients, while for private hospitals with 991 patients out of the total number patients at risk 130,047 (35.7%). For TNI hospitals with 254 patients out of 1,672 (9.1%) (8) patients.

Hospitals which should be the most appropriate health care facilities in terms of inpatient, outpatient, emergency, and 24 hours medical treatment services, turned out exposing people who receive medical and health services to the risk of nosocomial infection (9). Health workers who serve it and support staff are also confronted with infections (10). This is caused by transmission from the environment through media from hospital facilities, one of which comes from the environment around the patient such as the floor or wall of the hospital room which is a source of infection that is often contaminated (11). Therefore it is necessary to reduce the number of germs in the room including air, walls and floors. These efforts take the form of operational steps (disinfection, rational antibiotic therapy), organizational steps (hygiene committee, procedural guidelines, training programs), and structural steps. Cleaning is done routinely, especially cleaning immediately after the patient vomits or diarrhea because it can cause contamination (12).

Treatment room is one of the rooms that allows the growth of germs, for example on the floor, the factors that influence are weight of rubbish, floor cleaning, frequency of floor cleaning, number of visitors, number of patients, temperature, humidity and room lighting. In the treatment room, all types of disease sufferers were treated in that room based on the type of disease, and in this room there are many activities occurring from

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various walks of life, such as the sufferers themselves, medical and non-medical staff and visitors, in contrast to the operating and isolation rooms whose activities are limited (13) .

Indonesian government has determined the requirements for the quality of environmental health in hospitals based on the Regulation ofHealth Minister RI Number 7 Year 2019 concerning Environmental Health of Hospitals which aims to avoid all risks and health problems especially those originating from the hospital environment. In this regulation, has set the provisions of hospital treatment rooms, treatment rooms in hospitals must meet health requirements, both air quality, construction and facilities. Treatment rooms can transmit diseases through medical and non-medical tools, used materials, food and beverages, medical and non-medical staff and visitors. If the hospital cannot fulfill the provisions in this regulation, then the result not only suffers from the patient medically but also economically large losses (14). The hospital environment that is not good will allow the transmission of diseases that can affect the health of the community in the hospital environment. Therefore hospital sanitation services need to be organized in order to create a clean environment so that it can support efforts to cure patients and can prevent transmission of nosocomial infections in the hospital environment .

Floors and walls are one part of the treatment room that can be a place of spread and habitat for pathogenic microbes such as *Streptococcus* sp. In general, these pathogenic germs come from air space, then the pathogenic germs spread and stick to floors and walls, then in all its activities, humans will contact or come into contact with the wall or floor. Pathogenic germs in the nursing room can come from outside the hospital environment and from indoor contamination (15).

One of the largest province in Indonesia is the province of East Java. East Java has a lot of hospitals, both central and regional government hospitals (RSUD) and private hospitals that have various types. From this background, the researchers wanted to analyze the total plate count (TPC) of germs on the walls and floors in the treatment room based on the hospital type in East Java and its impact on the environment and health.

II. RESEARCH METHODS

Type of research used in this research was quantitative research. Quantitative research was done by collecting quantitative data and processed using statistical techniques. The research design used was a *cross sectional* approach using data from the laboratory test results BBTKLPP Surabaya consisting of total plate count (TPC) of germs data which was on the walls and floors of the hospitalstreatment room in East Java on 2019. Location of data collection was carried out in hospitals in East Java. The population and sample size in this study were all hospitals in East Java that had examined the total plate count (TPC) of germs on the walls and floors in the treatment room as many as 24 hospitals. Analysis of the data in this study was a descriptive and cross tabulation (*cross tabulation*), then read the value of *contingency coefficient* to determine th strength of the relationship between the number of total plate count (TPC) germs on the walls and floors in the treatment room based onhospital type in East Java 2019.

III. RESULTS AND DISCUSSION

Distribution Overview of Hospital Type in East Java Which Conducting Total Plate Count (TPC) of Germs Test on The Walls and Floors of Hospital Treatment Room in East Java with Hospital Type on 2019

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In the Regulation of Health Ministry RI Number 30 Year 2019 concerning Hospital Classification and Licensing, it was explained that hospitals are classified according to their tasks, class and scope of work area in providing health services. In the regulation explained that there are 4 (four) types of hospitals in accordance with the class of service and the scope of health services provided. Consisting of hospitals type A, type B, type C and type D. All four classes of general hospitals have different specifications and abilities in the ability to provide health services, the four hospitals are classified into (16)

1. Type A Hospital

It is a top type hospital which is a central hospital and has complete medical service capabilities. Type A general hospitals have at least 4 basic specialist medical services consisting of: internal medicine, pediatric health, surgery and obstetrics and gynecology services, 5 (five) specialist medical supports, 12 (twelve) other specialists besides basic specialists, and 13 (thirteen) subspecialists

2. Type B Hospital

It is a hospital that still included in tertiary level health services which prioritizes subspecialty services. Also a further referral of type C hospitals. This hospital has facilities and medical service capabilities of at least 4 (four) basic specialists, 4 (four) specialist medical supports, 8 (eight) other specialists in addition to basic specialists, and 2 (two) basic subspecialist

3. Type C Hospital

It is a hospital which is a continuation of a level above that of primary health care. The services provided are already specialist and sometimes also provide sub-specialist services, and have facilities and medical service capabilities of at least 4 (four) basic specialists and 4 (four) specialist medical supports

4. Type D Hospital

Is a hospital that provides basic medical services, only limited to basic health services that have facilities and medical service capabilities of at least 2 (two) basic specialists.

An illustration of frequency distribution of germ counts (TPC) on the walls and floors of treatment rooms by hospital type can be seen in the following table.

T**able 1:**Frequency Distribution of HospitalsType Which Conducted the Total Plate Count (TPC) of Germs Test in the Treatment Room in East Java on 2019

No	Hospital Type	Frequency	Percentage (%)
1	A	1	4.17
2	B	12	50.00
3	C	7	29.17
4	D	4	16.67
Total		**24**	**100.00**

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Based on Table 1, it can be seen that the majority of hospitals type whichconduct test of total plate count (TPC) of germs in this research was type B as many as 12 hospitals (50.00%). Type B hospital is a hospital that has facilities and medical service capability of at least 4 (four) basic specialists, 4 (four) medical support specialists, 8 (eight) other specialists besides basic specialists, and 2 (two) basic subspecialists. According to research conducted by Tsutsui and Suzuki in 2018, the prevalence of pathogens in small hospitals is higher than that in large hospitals (9.37% vs 6.50%, respectively). Therefore, the same prevalence may be interpreted differently when the hospital type is taken into account (17).

Overview of Total Plate Count (TPC) of Germs on the Walls and Floors in the Hospitals Treatment Room in East Java with Hospital Type on 2019

Total plate count (TPC) testwas carried out in 24 hospitals throughout East Java. The test was carried out by BBTKLP Surabaya officer in January - June 2019. This test aimed to determine the number of germs on the walls and floors in the treatment room. By knowing the number of germs on the walls and floors in the treatment room we can get information about the incidence of nosocomial infections that may be transmitted through the room, because the polluted physical environment can act as a source of nosocomial infections (18).

Table 2: Results of Total Plate Count (TPC) Test of Germson the Walls and Floors of Hospital Treatment Room in East Java on 2019

No.	Hospital Name	Hospital Type	Total Plate Count (5-10 CFU / m^2) Regulation of Health Ministry Number 7 Year 2019			
			Wall	Criteria	Floor	Criteria
1	Hospital 1	A	1	fulfilled the requirements	<1	fulfilled the requirements
2	Hospital 2	B	0	fulfilled the requirements	1	fulfilled the requirements
3	Hospital3	B	<1	fulfilled the requirements	2	fulfilled the requirements
4	Hospital4	B	<1	fulfilled the requirements	<1	memenuhi batas syarat
5	Hospital 5	B	0	fulfilled the requirements	1	fulfilled the requirements
6	Hospital 6	B	11	Unfulfilled the requirements	8	Unfulfilled the requirements
7	Hospital 7	B	<1	fulfilled the requirements	<1	fulfilled the requirements
8	Hospital8	B	0	fulfilled the requirements	1	fulfilled the requirements
9	Hospital 9	B	0	fulfilled the requirements	<1	fulfilled the requirements
10	Hospital10	B	0	fulfilled the	<1	fulfilled the

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No.	Hospital Name	Hospital Type	Total Plate Count (5-10 CFU / m^2) Regulation of Health Ministry Number 7 Year 2019			
			Wall	Criteria	Floor	Criteria
				requirements		requirements
11	Hospital11	B	9	Unfulfilled the requirements	13	Unfulfilled the requirements
12	Hospital12	B	<1	fulfilled the requirements	8	fulfilled the requirements
13	Hospital13	B	<1	fulfilled the requirements	1	fulfilled the requirements
14	Hospital14	C	42	Unfulfilled the requirements	34	Unfulfilled the requirements
15	Hospital15	C	2	memenuhi batas syarat	<1	memenuhi batas syarat
16	Hospital16	C	17	Unfulfilled the requirements	7	Unfulfilled the requirements
17	Hospital17	C	<1	fulfilled the requirements	<1	fulfilled the requirements
18	Hospital18	C	<1	fulfilled the requirements	4	fulfilled the requirements
19	Hospital19	C	<1	fulfilled the requirements	<1	fulfilled the requirements
20	Hospital20	C	<1	fulfilled the requirements	<1	fulfilled the requirements
21	Hospital 21	D	<1	fulfilled the requirements	0	fulfilled the requirements
22	Hospital 22	D	<1	fulfilled the requirements	<1	fulfilled the requirements
23	Hospital 23	D	<1	fulfilled the requirements	<1	fulfilled the requirements
24	Hospital24	D	0	fulfilled the requirements	2	fulfilled the requirements

Source: BalaiBesar Teknik KesehatanLingkungan,East Java Province, 2019

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Wipe the walls and floors of the treatment room in the hospital has a limit in accordance with the Regulation of the Health Minister RI Number 7 Year 2019 Concerning Environmental Health of Hospital in the range of 5-10 CFU/cm^2 . Microbiology test results above showed that of 24 hospitals that conduct TPC test of walls and floors, the majority of total plate count (TPC) of germs on the walls and floors of treatment rooms qualify as many as 20 hospitals (83.3%) of the total hospitals examined (24 hospitals), while hospitals that have TPCtest resultsunfulfilled the requirements of 4 hospitals (16.7%). These results are consistent with Pratami's study (2012) which showed the average number of germs obtained from the walls and floors of the treatment room is around <1 CFU/cm^2 . The higher bacterial load may be due to temperature, humidity, insufficient ventilation, presence of unhygienic attached toilets and poor waste management system (19)

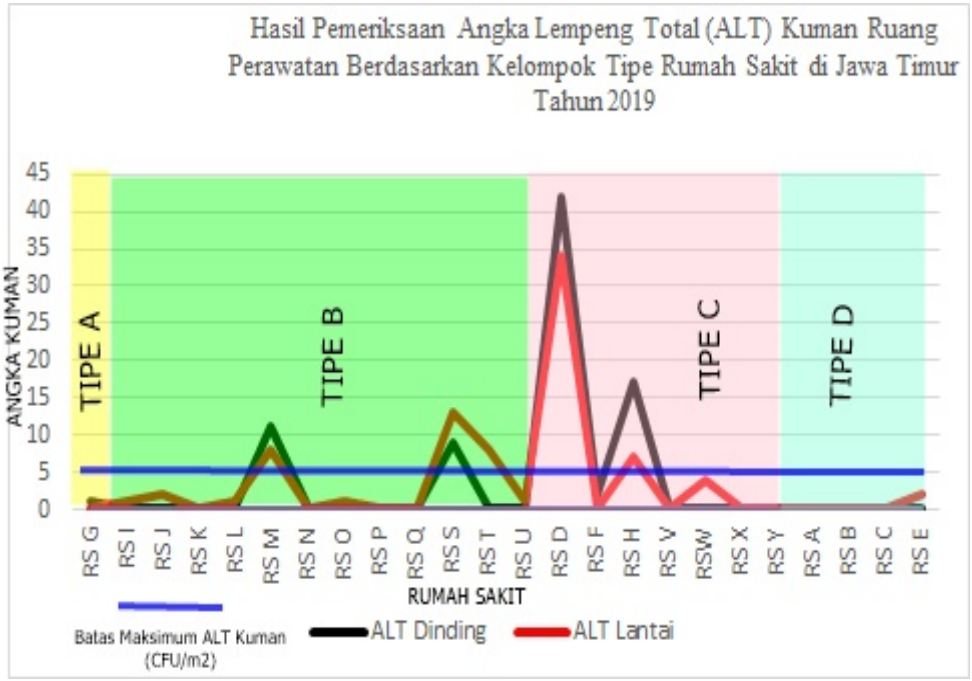

Figure 1: Results of Total Plate Count (TPC) Test of Germs in Treatment Room Based on Hospital Type in East Java on 2019

Source : Processed Results of Researchers sourced from BBKLP Data Surabaya, 2019

In figure 1 showed the total plate count (TPC) of germs in the treatment room both fulfilling the requirements and exceeding the requirements found in all types of hospitals. The number of type A hospitals that conduct TPC test on the walls and floors was only 1 hospital, type B hospitals were 12, type C is 7, and type D was 4 (Table 1). For the highest number of germs on the walls was in the amount of 42 CFU/m^2, whereas the highest on the floors was 34 CFU/m^2.

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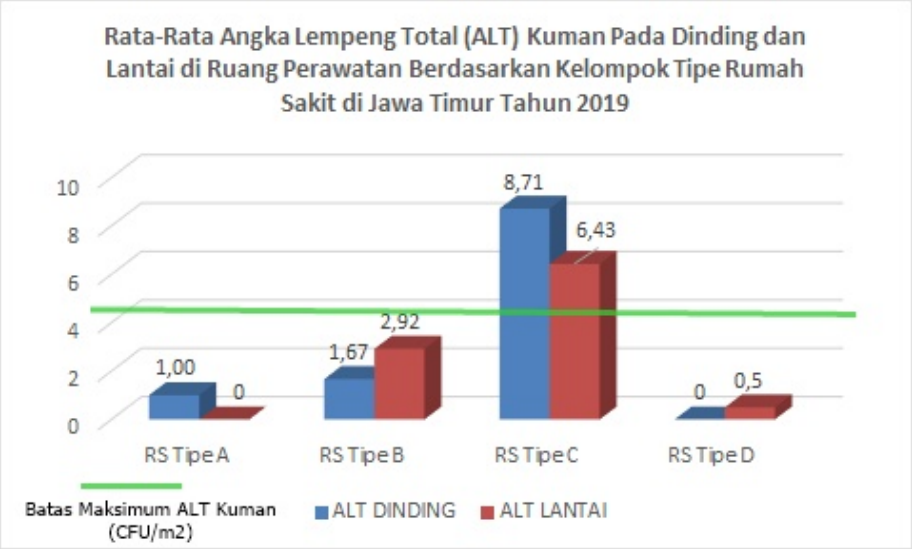

Figure 2: Average Number of Total Plate Count (TPC) of Germs on the Walls and Floors in the Treatment Room Based on Hospital Type in East Java on 2019

Source : Processed Results of Researchers sourced from BBTKLP Data Surabaya, 2019

Figure 2 shows for the average number of total plate count (TPC) of germs on the walls and floors, the highest was in the hospital type C's wallsby 8.71 CFU/m^2 and on the floorsby 6.43 CFU/m^2. The number of test samples for hospitals with type A was 1 hospital, type B were 12 hospitals, type C were 7 hospitals, and type D were 4 hospitals (Table 1.)

Frequency distribution of hospitals that fulfilled and those that unfulfiled the requirements of total plate count (ALT) of germs in the treatment room can be seen in the following Table 3:

Table 3: Frequency Distribution of Total Plate Count (TPC) of Germs on the Walls and Floors in the Hospitals Treatment Room in East Java on 2019

No	Categories of Total Plate Count (TPC) of Germs on the Walls and Floorsin the Treatment Room Test Results	Frequency	Percentage
1	Fulfilled the Requirements	20	83.3%
2	Unfulfilled the Requirements	4	16.7%
Total		**24**	**100%**

Based on Table 3 it can be seen that the majority of the total plate count (TPC) of germs on the walls and floors in the treatment room taken for TPC test of germs as many as 83,3% fulfilled the specified requirements (5-10 CFU / m2).

The results above showed that the implementation of environmental sanitation, especially the level of cleanliness of walls and floors has carried out well, but needed to be improved to prevent secondary infections in hospital communities, especially in treatment rooms. Room density and air circulation needed to be monitored

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periodically to avoid the risk of secondary cross infection between patients, in addition, increasing personal hygiene of medical staffs and paramedics was also needed to avoid the risk of being infected from patients treated. Hospitals B and E had a sample of Total Plate Count (TPC) which were not eligible for the treatment room, this indicated the need for evaluation of hospital environmental sanitation procedures to reduce the potencyof pathogenic bacterial contamination that caused nosocomial infections in the hospital.

According to Abdullah and Hakim (2011), the existence of microbes caused by physical environmental factors (in animate), the existence of microbes in the walls can also be caused by the biological environment that is always associated with the physical environment. Physical factors of transmission or spread of germs include hospital staff and patients who can transfer germs to each other. Unhealthy and unclean behavior of staffs, patients, and family members of patients visiting hospitals can increase the rate of transmission or spread of germs (20).Survival characteristics of individual species or strains on floors and other surfaces could determine the degree of infection risk for patients from inadequately cleaned rooms or bed spaces(21).

According to Oktarini (2013), the high level of TPC in the floors can be caused by various factors such as inappropriate use of disinfectant doses, improper way of using disinfectants, and floors mopping which should always be done any time but were not done optimally by staffs. In addition, the high number of germs floors can also be affcted by several other factors such as patients, visitors, animals and insects also air (22). In addition, routine mopping by the cleaning service staffs must also be considered, routine surface cleaning is recommended to control the spread of pathogens in hospital environments. In Norway, ordinary cleaning of patient rooms is traditionally performed with soap and water (23). According to the Ministry of Health RI (2017), disinfectants are chemical substances that are used to prevent the growth of microorganisms by blocking / damaging them and are commonly used on inanimate objects. Disinfectants are very important for hospitals and clinics. Disinfectants will help prevent infections in patients which come from medical tools and staffs in the hospital and also help prevent medical staffs being infected by the patient's diseases. It should be noted that disinfectants must be used appropriately (24).The biological disinfection by correponding bacteriophage preparation was found to be an effective measure for the environmental disinfection. (25).

Based on the distribution table above, it can be concluded that the majority of microbiological tests had results which fulfilled the requirements when viewed from the total plate count (TPC) on the walls and floors swab test. The number of germs found on walls and floors can be affected by the condition of air space and vice versa. If biological contamination occured in room air, these conditions caused biological contaminants in hospital floors and walls or vice versa, room air condition was actually affected by biologically polluted walls and floors condition (22).

Hospitals in districts/cities in East Java Province which have a number of results do not fulfill the requirements, indicating that there is still a lack of environmental sanitation efforts. These conditions need an effort to improve governance such as procedures, methods, frequency and management of room cleaning to create room air quality from floors and walls swabs variable. The high number of germs on the walls and floors of hospitals can be caused by various factors such as the inappropriate use of disinfectant doses, improper way of using disinfectant, and the floors mopping which should always be done any time were not done optimally by staffs. In addition, the high number of germs floors can also be affected by several other factors such as patients, visitors, animals and insects also air (26).

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Research conducted by Nurina et al (2007) stated that the amount of floor germ was influenced by various factors such as the number of patients, the number of visitors, room's temperature, room's humidity, room's lighting, result of waste, floor cleaning frequency and use of appropriate (27).

Supervision of hospital hygiene and sanitation is very necessary in hospital operations, these activities can be done by monitoring and evaluating the implementation procedures and compliance with the implementation procedures of environmental sanitation procedures to inspecting laboratory periodically to monitor the total plate count (TPC) in a hospital. The use of personal protective equipment both for high-risk groups, especially medical staffs and paramedics who are in direct contact with patients is one of the efforts in breaking the chain of transmission and spread of secondary infections in hospitals (28).Nosocomial infection can be prevented by minimizing the spread of causative agents, isolation for the patient suffering from infectious disease and maintaining well sanitary conditions in hospitals and medical care unit. In the present review, we have selected five significant areas, in which efforts can be made to prevent nosocomial infections (29).

The spread of number of germs on walls and floors can come from 3 environmental phenomena, namely: dust particles, droplets, and core droplets. Most dust particles enter the room through shoes, clothing, and due to the opening of doors and windows and due to poor ventilation units. Droplets in the air formed during human activities can only contain dust or biological material dust such as bacteria. In hospital, droplets that are formed during human activities will enter and distribute through the air stream, which cause a risk of transmission of dangerous infections (30).

Cross Tabulation of Total Plate Count (TPC) of Germs in Hospital Treatment Room in East Java with Hospital Type on 2019

From secondary data that had obtained, cross tabulation was done to find out the total plate count (TPC) of germs on the walls and floors in the treatment room based on the hospital type that has carried out the TPC test of germs, the results were as follows:

Table 4: Cross Tabulation of Total Plate Count (TPC) of Germs on the Walls and Floors in Hospital Treatment Room in East Java with Hospital Type on 2019

Hospital Type	Categories of Number of Germs Test Result				Total Sample	
	Fulfilled the Requirements		Unfulfilled the Requirements			
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
A	1	100%	0	0%	1	100%
B	10	83,33%	2	16,67%	12	100%
C	5	71,43%	2	28,57%	7	100%
D	4	100%	0	0%	4	100%

Table 4 showed hospitals with type B that carried out TPC test of germs on the walls and floors in the treatment room had a result of 16.67%, did not fulfill the requirements and type C hospitals as much as 28.57% did not fulfill the requirements. So it can be concluded if the TPCof germs sample on the walls and floors of the treatment room that did not fulfill the highest requirements was found in hospitals with type C.

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Total Plate Count (TPC) of Germs on Walls and Floors in Hospital Treatment Room in East Java Based on Hospital Type on 2019

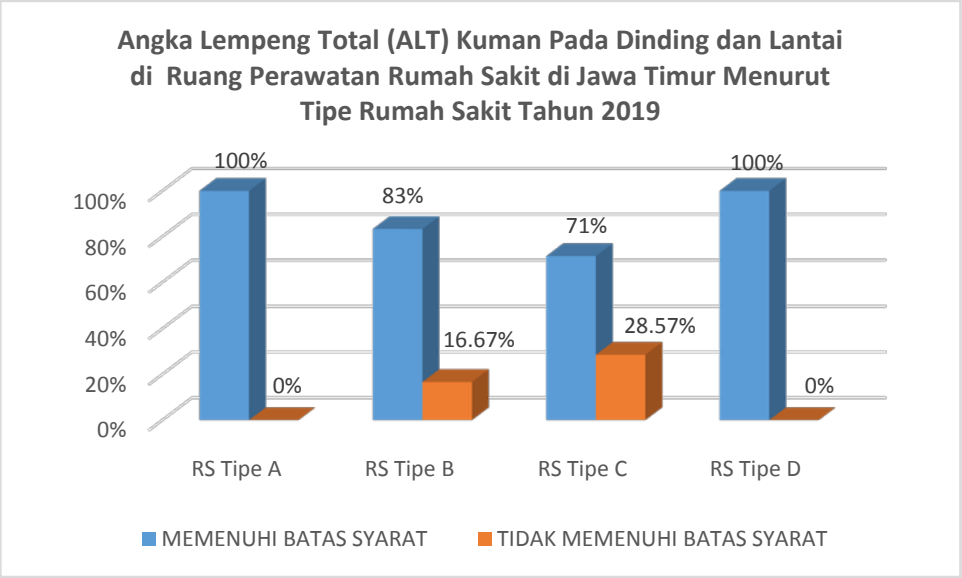

Figure 3: Total Plate Count (TPC) of Germs on Walls and Floors in Hospital Treatment Room in East Java Based on Hospital Type on 2019

Figure 3 showed that the total plate count of germs (TPC) on walls and floors in hospital treatment room in East Java above, it can be seen that showed the number of hospitals that did not fulfill the requirements were 16.67% of type B hospitals and 28.57% of type C hospitals.

Then from the results of the cross tabulation analysis obtained the results of the relationship between the number of plates (TPC) of germs on the walls and floors in the hospital treatment room with the hospital type with a coefficient contingency value of 0.258 which meant the level of strength of the relationship between these variables was included in the weak category (31). So when viewed from the coefficient contingency value, it meant that the better the hospital type did not guarantee that the total plate count (TPC) of the germs fulfilled or exceeded the requirements set by Regulation of Health Minister.

Spread patterns of germs can also come from outside the room from rotten organisms, dead plants, and animal carcasses. Mushroom pollen that has sporus can be air borne for germs from the outside and enter the room with a wind breeze. Germs can also enter the room through mosquito larvae and insects that can penetrate buildings. Spread of germs involves environmental media such as air and vectors as intermediaries or vehicles. Pathogenic microorganisms in the air, including bacteria, viruses, fungi and parasites, can cause nosocomial infections. In hospitals, this infection can occur in a person because he is infected by microorganisms of other people or by the normal flora of himself through contact with food, air, or objects that are not sterile (32). The spread of germs on the floors may also be through germs on visitors shoes or health staffs,shoe soles have been shown to transfer infectious microorganisms to floor and ground surfaces. However, the possible modes of transmission of

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infectious agents from floors or ground surfaces to human contact for infection have not been systematically reviewed(33).

Various researches of nosocomial infectious diseases in hospitals in the United States, United Kingdom, and Kuwait found types of germs (bacteria) such as *Escherichia coli, Klebsiella spp, Pseudomonas spp, Enterobakter spp, Proteus spp, Streptococcus spp, Acinetobacter spp, Citrobacter spp*, dan *Staphylococcus epidermis*. These microbes can cause nosocomial urinary tract infections (NUTI). Less sterile treatment rooms are potential to cause nosocomial infections as has happened in several hospitals in this country and abroad. When this happens, the consequences are not only medically suffered by the patients but also economically large losses. Nosocomial infections in general will cause severe diseases and a long recovery time so that the cost of treatment is also increasingly expensive (34). In addition, nosocomial infections can also cause death. Same as research conducted by (Pascale Fabbro-Peray, et.al., 2007)that stated nosocomial infection appeared to have a significant impact on mortality(35).

Based on Wikansari's research (2012) on the total test of germs and *Staphylococcus aureus* in the inpatient room X hospital in Semarang, the number of people in the room has an effect on the number of bacteria and on the human body parts there are *Staphylococcus aureus* bacteria such as on the surface of the skin, the nose that can move these bacteria can be transmitted by health staffs, visitors, and patients to someone who has low immunity through droplets when sneezing and coughing or in direct contact (18). In addition, the ventilation system affects the air circulation in the room. Air circulation plays a quite significant role in the number of microorganisms colonies including *Staphylococcus aureus* bacteria. In the research of Norma Velázquez (2017), poor air circulation can affect the existence of *Staphylococcus aureus* bacteria that can stick to walls and floors in hospitals, also cause nosocomial infections (36).

Medical staffs and tools become one of the factors in the development of germs on walls and floors. More contact with patients, with medical staffs and contact with medical tools, means that the degree of contamination become higher and the number of microorganisms is also increasing. Contamination of the hands of the paramedics, caused by factors that come from medical staffs, paramedics and the environment. In line with Pratami's research (2012) from the research results, the average number of germs obtained from the hands of medical staffs and paramedics was 10 colonies/cm^2 and the types of bacteria obtained were *Staphylococcus saprophyticus, Staphylococcus aureus, Staphylococcus epidermis, Serratia liquefacients, Serratia marcescens, Pseudomonas aeruginosa, Enterobacter aerogenes, Citrobacter freundi, Salmonella sp, Basillus cereus, Neisserria mucosa*, it can be concluded that there are pathogenic and non-pathogenic bacteria on the hands of medical staffs and paramedics at the Peritanology Unit RSUAM (37). In addition, high number of germs can occur due to lack of cleanliness in the treatment room, especially during visiting hours it is common for trash to be scattered in the treatment room. According to one of the patient's keeper, the treatment room was cleaned only once a day in the morning. Visitors and patient keepers are also a factor in the carrier of bacteria in the room. The more dense the occupants in the treatment room the higher the degree of contamination with more microorganisms (38).Collaboration between relevant authorities and the hospital and formation of an infection control committee with an executive working group were required to move the intervention process forward(39).

The number of germs is also affected by the condition of the hospital building. Old buildings have high number of germs (40). Based on the results of research conducted by Tinah (2016) in the inpatient room RSUD Dr. M. Haulussy Ambon Maluku Province is known that the hospital building was built since 1948, more or less 57 years and the newest building in the hospital is an office and surgery room while the ward building is an old

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building and has never been disinfected on the walls of the ward so the possibility of high numbers of germs in this hospital ward walls is caused by the age factor of the building which is quite old and has never been disinfected on the walls (41).

IV. CONCLUSION AND RECOMMENDARTIONS

Total plate count (TPC) test of germs on the walls and floors in the treatment room, showed that 83.3% of hospitals in East Java met the quality standards required by Regulation of Health Minister Number 7 Year 2019 concerning Hospital Environmental Health, and as many as 16.7% of hospitals did not fulfill the required quality standards. Type C hospitals that did not fullfill the requirements, the average total plate count (ALT) of germs on the walls was 8.71 CFU/m2 and the floors was 6.43 CFU/m2. There was a weak relationship between TPC of germs on the walls and floors in the treatment room with the hospital type (coefficient contingency of 0.258), which meant that a good type of hospital did not guarantee a small TPC of germs.

Suggestions are the need for further research, especially in terms of continued identification of microbes that are observed down to the species level and the calculation of total plate counts can be applied to medical tools, eating tools and other rooms in hospital. The hospital should maintain sanitation hygiene so that the number of germs on the walls and floors does not exceed the requirements, so that transmission of the disease is not caused by nosocomial infections.

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