

EFFECTIVENESS OF FLOOR CLEANING AND WALL CLEANING ON GROWTH OF PATHOGEN GERMS IN THE CURRENT ROOM OF DR KARIADI HOSPITAL, SEMARANG

EFEKTIFITAS PEMBERSIHAN LANTAI DAN PEMBERSIHAN DINDING TERHADAP PERTUMBUHAN KUMAN PATOGEN DI RUANG RAWAT RSUP DR KARIADI SEMARANG

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ABSTRACT

Surface swab examination is carried out to evaluate the cleaning that has been carried out both in detecting the presence of germs in the environment and also for checking the count of germ colonies on the floor surface. The results of the preliminary study by looking at the results of floor swab measurements after general cleaning, especially floor cleaning, obtained data from March - May 2022, 113 outpatient rooms, inpatient and operating rooms and found results that did not meet the quality standards for floor swabs, there were 33 rooms, namely operating room, central nutrition, delivery room, baby room, cardiac catheterization room, mortuary, Rajawali pharmacy, CSSD room, PBRT room, Garuda room, Kepodang and registration room. The aim is to determine the effectiveness of cleaning floors and walls against the growth of pathogenic germs in the Heart Installation. Quantitative research method which is descriptive analytic, test analysis using paired t-test and Wilcoxon. Results: there is no significant difference between cleaning the floor on the growth of pathogenic germs in Pre-post General Cleaning, namely 0.678. Floor Cleaning First-Second 3.5 Hours is 0.259.

Keywords: pathogenic germs; floor cleaning; wall cleaning

ABSTRAK

Pemeriksaan swab permukaan dilakukan untuk mengevaluasi pembersihan yang telah dilakukan baik dalam mendeteksi keberadaan kuman yang ada dilingkungan dan dilakukan juga pemeriksaan hitung koloni kuman permukaan lantai. Hasil studi pendahuluan dengan melihat hasil pengukuran swab lantai setelah dilakukan general cleaning khususnya pembersihan lantai didapatkan data pada bulan Maret - Mei 2022, 113 ruang rawat jalan, rawat inap dan kamar operasi dan ditemukan hasil yang tidak memenuhi syarat baku mutu usap lantai ada 33 ruang yaitu kamar operasi, gizi sentral, ruang bersalin, kamar bayi, ruang keteterisasi jantung, kamar jenazah, farmasi Rajawali, ruang CSSD, ruang PBRT, ruang Garuda, Kepodang dan Ruang pendaftaran. Tujuan untuk mengetahui efektifitas pembersihan lantai dan dinding terhadap pertumbuhan kuman pathogen di Instalasi Jantung. Metode Penelitian kuantitatif yang bersifat deskriptif analitik, analisa uji menggunakan paired t-test dan wilcoxon. Hasil : tidak ada perbedaan signifikan antara pembersihan lantai terhadap pertumbuhan kuman pathogen pada Pre-post General Cleaninng yaitu 0,678. Pembersihan Lantai 3,5 Jam Pertama-Kedua yaitu 0,259.

Kata kunci : kuman pathogen; pembersihan lantai; pembersihan dinding



INTRODUCTION

The quality of health that is demanded by a quality community provides safe services by minimizing risks and preventing injuries (Madjid & Wibowo, 2019). According to WHO, strategies to reduce injuries include the prevention and control of infection due to health services. In line with this, there is a policy in Indonesia to reduce the risk of infection (Permenkes RI No. 27, 2017).

Infections due to health services or Healthcare Associated Infections (HAIs) are infections that occur in patients during treatment in hospitals or other health facilities. Included in this definition are infections that were acquired in the hospital but only manifested after the patient was discharged. Nosocomial infections can be caused by pathogenic microorganisms such as bacteria, viruses, and fungi that spread from one patient to another through air, walls, and hospital furniture (Putra et al, 2022). Global data on HAIs is still very limited. In the United States, an estimated 1.7 million events are due to infection (9.3 infections per 1,000 patient days or 4.5 per 100 incoming patients, which accounts for more than 98,000 patient deaths (Masjid & Wibowo, 2019).

The prevalence in Indonesia of infection from 10 General Teaching Hospitals was found to be quite high, 6-16%, with an average of 9.8% (Purbandaru & Supriyadi, 2022). Other results from a point prevalence survey in 11 hospitals in DKI Jakarta by Perdalina Jaya and RSPI Prof. Dr. Sulianti Saroso Jakarta obtained nosocomial infection rates for Surgical Area Infections 18.9%, Urinary Tract Infections (UTI) 15.1%, Primary Blood Stream Infections 26.4%, pneumonia 24.5%, urinary tract infections other respiratory 15.1%, and other infections 32.1% (Retnaningsih, 2015).

Infections in hospitals can be prevented through the application of infection prevention principles in particular, namely the principle of universal precautions. Application of universal precautions is part of infection control efforts consisting of: (1) washing hands, (2) use of Personal Protective Equipment (PPE), (3) careful management of needles and sharp tools, (4)

management of medical devices used properly, (5) and waste management and room sanitation (Purbandaru & Supriyadi, 2022). Meanwhile, according to a report from Harapan Kita Hospital (2014), the incidence of infection in the operating area tends to increase, from 1.5% in 2013 to 1.8% in 2014. In addition, infection prevention and control measures can be carried out with a swab examination. The surface cleaning is carried out to evaluate the cleaning that has been carried out both in detecting the presence of germs in the environment and also checking the count of germ colonies on the floor surface. (Manap, 2016).

The results of the preliminary study by looking at the results of floor swab measurements after general cleaning, especially floor cleaning, obtained data from March - May 2022, 113 outpatient rooms, inpatient and operating rooms and found results that did not meet the quality standards for floor swabs, there were 33 rooms, namely operating room, central nutrition, delivery room, baby room, cardiac catheterization room, mortuary, Rajawali pharmacy, CSSD room, PBRT room, Garuda room, Kepodang and registration room. From these data, this research was conducted to determine the effectiveness of floor cleaning on the growth of pathogenic germs in the Ruwang Rawat RSUP Dr. Kariadi Semarang.

METHOD

This research is a quantitative research that is descriptive analytic, namely a method that functions to describe or provide an overview of an object under study through data or samples that have been collected as they are without conducting analysis to make general conclusions. (Sugiyono, 2019). Data analysis in this study was carried out by testing univariate, bivariate and multivariate analysis. (Situmorang, 2018). This research was conducted at RSUP Dr. Kariadi Semarang in outpatient rooms, VVIP inpatient rooms, Class 1, Class 2 and Class 3 in June 2022. The instrument used an observation sheet and then the data was analyzed using a different test (paired t test and Wilcoxon).

RESULTS

Table 1. Examination of Pathogen Germ Growth Cultures resulting from Floor Mopping and Wall Cleaning

	VIP	Class 1	Class 2	Class 3	operating room1	operating room2	Flexible room	Polyclinic
Floor mopping results								
Pretest	81	15	50	117	1	0	61	78
Posttest	135	13	82	50	0	29	25	80
Wall cleaning results								
Pretest	17	10	5	1	0	3	1	0
Posttest	135	18	7	26	50	2	1	2

Based on table 1, it shows the difference in the results of examining the growth of pathogenic germ cultures through the intervention of the results of floor mopping and the results of cleaning the walls.

Table 2. Distribution of Officer Compliance in Floor Mopping in accordance with Standard Operating Procedures

Officer Compliance in Floor Mopping	Obey		Not obey	
	f	%	f	%
VIP room	5	45,5	6	55,5
Class 1	7	63,6	4	36,4
Class 2	5	45,5	6	55,5
Class 3	5	50	5	50
Operating room1	5	45,5	6	55,5
Operating room 2	5	45,5	6	55,5
Flexible room	5	45,5	6	55,5
Polyclinic	5	45,5	6	55,5

Based on table 2, it shows the difference in the compliance and non-compliance rates of officers in mopping the floor in each ward.

Table 3. Data Normality Test Analysis before and after the intervention was carried out using the Shapiro Wilk test approach

Variable	P value
Number of germs on the floor before general cleaning	0,944
Number of germs on the floor after general cleaning	0,320
Number of germs on the floor in the first 3.5 hours	0,082
Number of germs on the second floor 3.5 hours	0,412
Number of germs on the wall before general cleaning	0,002
Number of germs on the walls after general cleaning	0,000
Number of germs on the wall in the first 3.5 hours	0,003
Number of germs on the walls 3.5 hours second	0,008

Table 3 shows the normality results using Shapiro Wilk with normal data distribution when the p value > 0.05. The results show the number of germs on the floor with a p value > 0.05 while the results of cleaning germs on the wall with a p value <0.05.

Table 4. Analysis of differences in floor cleaning and wall cleaning before and after the intervention

Variable	P value	Information
Floor cleaning pre-post general cleaning *	0,678	Not significant
Floor cleaning 3.5 hours first-second *	0,259	Not significant
Wall cleaning pre-post general cleaning **	0,176	Not significant
Wall cleaning 3.5 hours first-second **	0,089	Not significant

* Uji Paired t-test, ** Uji Wilcoxon

Table 4 shows the difference in value before and after cleaning the floor and cleaning the walls

DISCUSSION

The results of the Examination of Pathogen Germ Growth Culture results from mopping the floor showed that there was a change in the pattern of germs between before general cleaning and after general cleaning mopping the floor, there were germs found before general cleaning were not found again after general cleaning, and vice versa. Nosocomial infection data at Prof. Dr. R. D. Kandou Manado said the types of bacteria in the operating room that were found on walls, floors and medical instruments were *Bacillus subtilis* and *Staphylococcus* (Ahmad, 2020).

The results of research on floors, walls and operating tables in the operating room at RSUD DR. M Yunus Bengkulu Province obtained patterns of *staphylococcus*, *bacillus*, *strepto bacillus*, and *Streptococcus* bacteria. While the results of research on the walls and floors in the ICU RSUD Dr. Moewardi Surakarta on walls by 4.33% and floors 15.18% with bacterial patterns found on walls and floors are *acinetobacter Baumanii*, *Staphylococcus* sp and *Bacillus* sp (Nugraha, 2017). Floors must be made of strong, smooth, waterproof, non-slip, bright color, flat surface, not wavy so it is easy to clean regularly 3 times a day. The floor meeting the wall must be curved so that it is easy to clean. The ideal floor antiseptic solution for use is long term, works fast

in killing germs, non-toxic, not affected by environmental factors, easy to use with clear usage instructions, odorless, economical, cleans well, and is environmentally friendly.

Results of Inspection of Pathogen Germ Growth Culture results of cleaning the walls showed that there was a change in the pattern of germs between before general cleaning and after general cleaning the walls, there were germs that were found before general cleaning were not found again after general cleaning the floors, and vice versa. However, there was no significant difference between before and after general cleaning, i.e. no fungus was found before general cleaning and after general cleaning, no fungus was found. Hospital construction for walls must be made strong, flat, and watertight so that it is easy to clean periodically with a fixed schedule once every 3-6 months. Paint the walls in bright colors and use paint that does not fade and does not contain heavy metals (Konoralma, 2019)

The results obtained from the 11 steps of SPO floor mopping were observed from 17 rooms selected as research objects or locations, the lowest average SPO floor mopping compliance was 45.5% while the highest was 63.6% so that it can be concluded that the mean SPO floor mopping compliance, officers are still lacking with an average compliance achievement

of 47.63% less than 100% of the compliance target that must be achieved.

Mopping Frequency results obtained regarding compliance with mopping standards in accordance with the Cooperation agreement between Dr. Kariadi Hospital and Vendors / 3rd parties, for 1 shift it reached 100%, namely 2X, while for 2 shifts it was supposed to do 5X mopping only 3X mopping, so no reached 100%, so it can be concluded from the floor mopping activities carried out by Cleaning Service or House Keeping officers, both those on duty 1 shift achieved 100% while those on 2 shifts the frequency of mopping floors was not fully achieved 100%.

The results of the dilution carried out in 17 areas of floor mopping amounted to 100% not in accordance with the dilution according to product or manufacturer standards, while from the selection of the type of disinfectant according to the Floor Cleaning SPO there were 23.53% of the 17 rooms observed, while 76.46 % does not match the disinfectant that has been set in the Floor Cleaning SPO

From the results of the data normality test, there were 2 groups of data where the data on the number of germs on the floor before general cleaning, after general cleaning, 3.5 hours after the first hour of general cleaning, and the second 3.5 hours, the data were normally distributed so that this study used the Test Paired t-test, while for data on the number of germs on the wall before general cleaning, after general cleaning, 3.5 hours after the first hour of general cleaning, and the second 3.5 hours, the data were not normally distributed, so this study used the Wilcoxon test.

After statistical tests were carried out according to the results of the data normality test and the appropriate statistical tests, it was found that the results were not significant between the pre-post general cleaning floor cleaning and the first-second 3.5 hour floor cleaning. As for the complete results, there is no significant difference between the pre-post general cleaning floor

cleaning, which is 0.678. Floor Cleaning First-Second 3.5 Hours is 0.259.

CONCLUSION

The results of diluting the floor cleaning disinfectant carried out in 17 floor mopping areas amounting to 100% dilution did not comply with product or manufacturer standards. The results of selecting the type of disinfectant from the 17 rooms observed were 23.53% in accordance with the SPO for cleaning floors, and 76.46% were not appropriate. Compliance with the Floor Cleaning SPO, amounting to 47.63%, this means that the floor cleaning staff has not complied with the Floor Cleaning SPO. The frequency of mopping compared to the standard mopping for 1 shift reaches 100%, which is 2X, while for 2 shifts what should be done 5X mopping is only done 3X mopping, so 100% is not achieved. There was no significant difference between floor cleaning and the growth of pathogenic germs in Pre-post General Cleaning, namely 0.678. Floor Cleaning First-Second 3.5 Hours is 0.259. There was no significant difference between wall cleaning and the growth of pathogenic germs in Pre-post General Cleaning, namely 0.176. Wall Cleaning 3.5 hours First-Second 0.089.

REFERENSI

- Akhmad, F., Farmasi, P. S., Kedokteran, F., & Ilmu, D. A. N. (2017). 9) Fandi Akhmad - Fkik. September.
- Joko Pitoyo, Arfiani Rachmaawati, F. L. (2020). Pembersihan Lantai kamar Operasi Zona 4 Terhadap Jumlah Koloni Bakteri. *Keperawatan*, 10(2), 92– 101.
- Juliandi, A. I. (2020). Metode Penelitian Kuantitatif. PMK No 27 Tahun 2017. Pencegahan dan Pengendalian Infeksi
- PMK No 7 Tahun 2019. Kesehatan Lingkungan
- Lestari, P. M., Supandi, S., & Pahriyani, A. (2019). Pembuatan Karbol sebagai Desinfektan Lantai. *Jurnal SOLMA*, 8(2), 193. <https://doi.org/10.29405/solma.v8i2.3183>
- Lutvi Indahyani (2008), Hubungan Frekuensi Pembersihan Lantai Tempat masak dengan Angka Kuman
- Manap, U. R. S. (2016). Gambaran Sanitasi Lingkungan Rumah Sakit Berdasarkan Parameter Fisik Dan Biologi (Studi Kasus Pada 2 Rumah Sakit Tipe A)

- di Provinsi DKI Jakarta Tahun 2016. UIN Syarif Hidayatullah Jakarta.
- N, F. S. I. K. A. (2004). Evaluasi Kualitas Bakteriologi Udara Dan Usap Lantai
- Ningsih, T. A., Iravati, S., & Nuryastuti, T. (2016). Angka kuman di ruang rawat inap RSUD Dr. M. Haulussy Ambon. *Berita Kedokteran Masyarakat*, 32(6), 183. <https://doi.org/10.22146/bkm.8763>
- Nunung Herlina (2015), Hubungan Kepatuhan Pemasangan Infus dengan keadian Plebitis di Ruang Rawat Inap RSUD A.W. Sjahranie Samarinda. *Jurnal Ilmu Kesehatan*. Vol. 6. No 1. 2018.
- Oktarini, M. (2013). Angka dan pola kuman pada dinding, lantai dan udara di ruang ICU RSUD Dr. Moewardi Surakarta. *Journal Publikasi Muhammadiyah Surakarta*, 1(1), 8.
- Situmorang, S. h. (2018). Analisis Data Untuk Riset Manajemen dan Bisnis (2nd ed.).
- Suci Amining Tyas (2022). Efektifitas Desinfektan terhadap Kualitas Angka Kuman Lantai dan Dinding Ruang Laboratorium PCR RS Jiwa Menur, Surabaya : *Jurnal Kesehatan Lingkungan, Poltekkes Kemenkes Surabaya*, 24 November 2022.
- Sugiyono. (2019). Metode Penelitian Kuantitatif, Kualitatif, Dan R&D.
- Windi Wulandari, (2015). Angka Kuman Udara dan Lantai Ruang Rawat Inap RSU PKU Muhammadiyah Yogyakarta. *Jurnal Berkala Kesehatan*. Vol.1. No.1. November 2015: 13-20
- Wismana, W. S. (2016). Gambaran kualitas mikrobiologi udara kamar operasi dan keluhan kesehatan. *Jurnal Kesehatan Lingkungan*, 8(2), 219–228. <https://e-journal.unair.ac.id/JKL/article/download/8015/474>
- 9
- Wulandari, W., Sutomo, A. H., & Iravati, S. (2016). Angka Kuman Udara Dan Lantai Ruang Rawat Inap Rumah Sakit Pku Muhammadiyah Yogyakarta. *Jurnal Berkala Kesehatan*, 1(1), 13–20. <https://doi.org/10.20527/jbk.v1i1.655>
- Yon Triono 2017 dengan judul : Tingkat Kepatuhan Perawat Melaksanakan Standar Operasional Prosedur (Sop) Sterilisasi Terhadap Jumlah Koloni Dan Jenis Bakteri Di Unit Pelayanan Umum Gigi Rsgm Universitas Jenderal Soedirman Purwokerto
- Masjid. T, & Wibowo, A. (2019). Analisis Penerapan Program Pencegahan dan Pengendalian Infeksi di Rawat Inap RSUD Tebet Tahun 2017. *Jurnal Administrasi Rumah Sakit*. Volume 4 No 1
- Putra, A.N.P & dkk. (2022). Program Pencegahan dan Pengendalian Infeksi (PPI) di Rumah Sakit X Kabupaten Malang. *Media Husada Journal of Environmental Health*. Volume 2 No. 1
- Purbandaru A.P & Supriyadi. (2022). Tindakan Pengendalian Infeksi Pada Perawat Di Ruang Rawat Inap di Rumah Sakit Kota Semarang. *Jurnal LINK*. Volume 18. No. 2
- Retnaningsih, D. (2015). Pengelolaan Universal Precautions Dalam Pencegahan Penyakit HIV/AIDS Di RSUD Tugurejo Semarang. *The 2nd University Research Coloquium 2015*. Semarang: Program Studi Ilmu Keperawatan STIKES Widya Husada Semarang
- Nugraha FD. Angka dan pola bakteri penyebab infeksi nosokomial pada dinding, lantai dan meja operasi Rumah Sakit Umum Daerah (RSUD) DR. M. Yunus Provinsi Bengkulu [skripsi]. Bengkulu: Universitas Bengkulu;2017
- Konoralma K. (2019). Identifikasi Bakteri Penyebab Infeksi Nosokomial Di Rumah Sakit Umum GMIM Pancaran Kasih Manado. *Jurnal KESMAS* Volume 8 No. 1