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ABSTRAK

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ANALISIS EFEKTIVITAS INSTALASI PENGOLAHAN AIR LIMBAH TERHADAP PARAMETER *COLIFORM* PADA IPAL RSUD dr. SOEKARDJO KOTA TASIKMALAYA

Limbah cair rumah sakit berpotensi mengandung mikroorganisme patogen seperti bakteri *Coliform* yang berbahaya bagi lingkungan dan kesehatan masyarakat. Temuan awal menunjukkan kandungan *Coliform* di RSUD dr. Soekardjo Kota Tasikmalaya masih melebihi baku mutu, sehingga kinerja Instalasi Pengolahan Air Limbah (IPAL) perlu dievaluasi. Tujuan dari penelitian ini adalah untuk menganalisis perbedaan kandungan *Coliform* pada *inlet* dan *outlet* serta menganalisis efektivitas Instalasi Pengolahan Air Limbah terhadap kandungan *Coliform* di Instalasi Pengolahan Air Limbah RSUD dr. Soekardjo Kota Tasikmalaya. Jenis penelitian ini adalah kuantitatif dengan pendekatan *cross sectional*. Sampel berupa air limbah yang diambil menggunakan teknik *grab sampling* selama 7 hari berturut-turut pada pukul 09.00 WIB untuk *inlet* dan pukul 13.00 WIB untuk *outlet*. Pemeriksaan kandungan *Coliform* menggunakan metode *Most Probable Number* (MPN). Analisis data dilakukan secara univariat dan bivariat menggunakan uji *Wilcoxon Signed Rank Test*. Hasil penelitian menunjukkan kandungan *Coliform* pada *inlet* berkisar antara 460.000–1.100.000 MPN/100 mL, sedangkan pada *outlet* berkisar antara 43.000–460.000 MPN/100 mL. Efektivitas rata-rata penurunan sebesar 83,46%, namun seluruh hasil *outlet* tetap melampaui baku mutu Permen LHK No. 68 Tahun 2016 (maksimal 3.000 MPN/100 mL). Uji statistik menunjukkan terdapat perbedaan signifikan kandungan *Coliform* antara *inlet* dan *outlet* ($p = 0,027$). Kesimpulan penelitian adalah terdapat perbedaan signifikan kandungan *Coliform* sebelum dan sesudah pengolahan. IPAL dinilai cukup efektif menurunkan konsentrasi bakteri, namun gagal memenuhi standar baku mutu akibat tidak berfungsinya unit desinfeksi (klorinasi). Disarankan bagi rumah sakit untuk segera memperbaiki unit klorinasi serta mengoptimalkan pre-treatment pada unit penghasil limbah kompleks seperti laundry, laboratorium, dan *rontgen*.

Kata Kunci: IPAL, *Coliform,* efektivitas, air limbah, rumah sakit

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ABSTRACT

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ANALYSIS OF THE EFFECTIVENESS OF A WASTEWATER TREATMENT PLANT ON COLIFORM PARAMETERS AT THE DR. SOEKARDJO GENERAL HOSPITAL IN TASIKMALAYA

Hospital liquid waste has the potential to contain pathogenic microorganisms such as Coliform bacteria that are harmful to the environment and public health. Initial findings show that the content of Coliform at dr. Soekardjo Hospital in Tasikmalaya City still exceeds quality standards, so the performance of the Wastewater Treatment Plant (WWTP) needs to be evaluated. The purpose of this study is to analyze the difference in Coliform content at the inlet and outlet and analyze the effectiveness of the Wastewater Treatment Plant on the Coliform content in the Wastewater Treatment Plant of dr. Soekardjo Hospital, Tasikmalaya City. This type of research is quantitative with a cross sectional approach. Samples in the form of wastewater were taken using the grab sampling technique for 7 consecutive days at 09.00 WIB for the inlet and at 13.00 WIB for the outlet. Coliform content examination using the Most Probable Number (MPN) method. Data analysis was carried out univariate and bivariate using the Wilcoxon Signed Rank Test. The results showed that the content of Coliform at the inlet ranged from 460,000–1,100,000 MPN/100 mL, while at the outlet it ranged from 43,000–460,000 MPN/100 mL. The average effectiveness decreased by 83.46%, but all outlet results still exceeded the quality standards of the Minister of Environment and Forestry Regulation No. 68 of 2016 (maximum 3,000 MPN/100 mL). Statistical tests showed that there was a significant difference in coliform content between inlets and outlets ($p = 0.027$). The conclusion of the study was that there was a significant difference in the content of Coliform before and after processing. WWTP is considered quite effective in reducing the concentration of bacteria, but it fails to meet quality standards due to the malfunction of the disinfection (chlorination) unit. It is recommended for hospitals to immediately repair chlorination units and optimize pre-treatment in complex waste generating units such as laundry, laboratories, and X-rays.

Keywords: *WWTP, Coliform, effectiveness, wastewater, hospital*