

ABSTRAK

Hiperbilirubinemia neonatal atau jaundice pada bayi baru lahir memerlukan penanganan cepat, salah satunya melalui terapi sinar biru (bluelight phototherapy). Terapi ini mengandalkan lampu bluelight untuk mengubah bilirubin menjadi bentuk larut air yang mudah dikeluarkan dari tubuh. Namun, intensitas cahaya lampu dapat menurun seiring waktu akibat keausan dan perubahan material, yang berdampak pada efektivitas terapi. Penelitian ini bertujuan untuk menganalisis penurunan kinerja lampu bluelight seiring usia pemakaian. Data diperoleh dengan mengukur intensitas cahaya lampu bluelight selama tiga bulan dengan jarak 50 cm menggunakan alat ukur radiometer. Analisis dilakukan menggunakan metode regresi linier melalui aplikasi Orange Data Mining. Hasil penelitian menunjukkan penurunan intensitas cahaya dari 18,662 $\mu\text{W}/\text{cm}^2/\text{nm}$ menjadi 5,341 $\mu\text{W}/\text{cm}^2/\text{nm}$, dengan nilai MSE = 1,947, RMSE = 1,395, MAE = 1,116, dan $R^2 = 0,996$, yang mengindikasikan hubungan yang sangat kuat antara usia pemakaian lampu dan penurunan intensitas cahaya.

Kata Kunci: Hiperbilirubin, Bluelight, Regresi linier, Intensitas, Orange Data Mining,

ABSTRACT

Neonatal hyperbilirubinemia, or jaundice in newborns, requires prompt treatment, one of which is through blue light therapy (bluelight phototherapy). This therapy relies on bluelight lamps to convert bilirubin into a water-soluble form that can be easily excreted from the body. However, the intensity of the lamp's light can decrease over time due to wear and material degradation, affecting the therapy's effectiveness. This study aims to analyze the decline in bluelight lamp performance over its usage period. Data were obtained by measuring the intensity of the bluelight lamp over three months at a distance of 50 cm using a measurement device. The analysis was conducted using linear regression methods through the Orange Data Mining application. The study results showed a decrease in light intensity from 18,662 $\mu\text{W}/\text{cm}^2/\text{nm}$ to 5,341 $\mu\text{W}/\text{cm}^2/\text{nm}$, with $\text{MSE} = 1.947$, $\text{RMSE} = 1.395$, $\text{MAE} = 1.116$, and $R^2 = 0.996$, indicating a very strong relationship between lamp usage time and the decrease in light intensity.

Keywords: Hyperbilirubine, Bluelight, intensity, Linear regression, Orange Data Mining,