

ABSTRAK

Kelahiran prematur dapat menyebabkan kemungkinan komplikasi tetapi Inkubator telah terbukti mengurangi angka kematian neonatal. Pengangkutan bayi baru lahir adalah salah satu masalah terpenting dalam periode neonatal. Penelitian ini memperkenalkan *Transport baby incubator* dengan Sistem Kontrol Suhu *Fuzzy logic* dan *Fast Charging Battery*, dirancang untuk meningkatkan perawatan bayi prematur di Rumah Sakit Hasan Sadikin Bandung. Sistem kontrol suhu berbasis *fuzzy logic* dan baterai LiFePO₄ dengan sistem pengisian cepat memungkinkan inkubator beroperasi lebih lama tanpa sumber daya listrik AC, yang vital selama transportasi. Hasil pengujian fuzzy logic bahwa semakin besar nilai fuzzifikasi maka semakin kecil defuzzifikasi begitu sebaliknya. Hasil pengujian suhu menunjukkan toleransi warm up time $\leq 2\%$ dan pada saat steady state $\leq 1\%$. Perbandingan suhu sensor dan incubator analyzer fluke dibawah 1% dan kelembapan dibawah 0.5%. Hasil pengujian fast charging setiap kenaikan 10% rata-rata waktu tempuh 14.5 menit. Inovasi ini diharapkan dapat meningkatkan kualitas perawatan neonatal, terutama selama transportasi, serta memberikan contoh bagi rumah sakit lainnya dalam meningkatkan perawatan bayi prematur.

Kata Kunci : Transport baby incubator, *fuzzy logic temperature control*, *fast charging battery*, *neonatal care*, *premature babies*.

ABSTRACT

Preterm birth can lead to possible complications but incubators have been shown to reduce neonatal mortality. Transportation of newborns is one of the most important issues in the neonatal period. This study introduces a Transport baby incubator with a Fuzzy Logic Temperature Control System and Fast Charging Battery, designed to improve the care of premature babies in Hasan Sadikin Hospital Bandung. A fuzzy logic-based temperature control system and LiFePO₄ battery with a fast charging system allow the incubator to operate longer without an AC power source, which is vital during transportation. Fuzzy logic test results that the greater the value of fuzzification, the smaller the defuzzification vice versa. Temperature test results showed a tolerance warm-up time of 2% and a time of steady state of 1%. Comparison of temperature sensor and incubator analyzer fluke below 1% and humidity below 0.5%. Fast charging test results in every 10% increase in average travel time of 14.5 minutes. This innovation is expected to improve the quality of neonatal care, especially during transportation, as well as set an example for other hospitals in improving the care of premature babies.

Keywords: Transport baby incubator, fuzzy logic temperature control, fast charging battery, neonatal care, premature babies.