

## **ABSTRACT**

Hospitals play a vital role in the healthcare system by providing complex curative services, emergency care, knowledge transfer centers, and medical training. However, challenges such as shortage of medical staff, especially nurses, and issues with intravenous fluid monitoring often occur, leading to the potential for nurse negligence, errors, and delayed patient care. The delayed replacement of depleted intravenous fluid can cause blood from the venous vessels to enter the infusion tube due to differences in air pressure. This poses a potentially fatal situation as it can impede blood circulation, result in oxygen deficiency in the body, and potentially lead to death.

To address the issue of delayed infusion fluid replacement, the Smart Infuse Dosing and Monitoring System has been designed. This device can monitor the volume of infusion fluids with a maximum reading range of 500 ml, track patient infusion rates with a range of 0 – 20 drops per minute (DPM), and remotely control the DPM rate within a maximum distance of 250 m.

Research results show that the use of the Smart Infuse Dosing and Monitoring System can minimize delays in patient infusion management. The device can monitor the infusion fluid volume within a range of 0-500 ml, detect the flow rate with a range of 0-20 drops per minute (DPM), control the flow rate with options of 0, 5, 10, 15, and 20 DPM at a maximum distance of 250 meters, and provide notifications of the infusion fluid volume to medical personnel with four parameters (250 ml, 125 ml, 25 ml, and blockage).

**Keywords:** Infusion fluid volume, Flow rate, Flow rate control, IoT