

ABSTRACT

Disorders of the prostate gland, such as Benign Prostatic Hyperplasia (BPH), often go undetected at an early stage as the symptoms are often vague or not even felt at all. One non-invasive method that can be utilized to detect these disorders is uroflowmetry, which is the examination of urine flow during micturition. In this study, researchers developed a portable uroflowmeter system based on a Load Cell sensor designed to measure urine volume and analyze urine flow patterns more practically. This system is made in a simple form and can be used independently by patients, making it very suitable for home monitoring. The prototype of the device was tested using simulated liquid as a substitute for urine, with test scenarios that represent normal conditions and conditions with disorders such as BPH. The test results show that the device is able to detect volume changes with an average accuracy of 99.82%, an average error of 0.75 grams, and a percentage error of 0.34% based on 40 data samples. In addition, the system is also able to distinguish normal urine flow patterns, which are generally characterized by symmetrical curves and high flowrates, from abnormal urine flow patterns that tend to be unstable, discontinuous, and have low flowrates. Data analysis was performed using the linear regression method to determine the relationship between the weight of the liquid measured by the Load Cell and the volume of urine released. Through this approach, the system is expected to be an effective early diagnosis tool for urinary tract disorders, especially in elderly men, with the advantages of low cost, ease of use, and the ability to provide fairly accurate results for self-monitoring of prostate conditions.

Keywords: *Benign Prostatic Hyperplasia, Load Cell, Linear Regression, Uroflowmeter, Accuracy.*