

ABSTRACT

Blood pressure is the amount of blood forced out that pressed against the arterial walls as the heart pumps blood throughout the body. Blood pressure is one of measurement that is important in maintaining a healthy body because if someone has a high blood pressure in the long term, it will lead to a separation in the walls of arteries and lead to rupture of blood vessels. Rupture of blood vessel can cause stroke. In general, high blood pressure show no symptoms or signs mean that a patient with hypertension is very difficult to know whether they have high blood pressure. Therefore, we need a measurement tool of high blood pressure in non-invasive.

Design photoplethysmograph in this study is using the infrared wavelength of 940 nm and a phototransistor light receiver, and microprocessor as the conversion to digital. In this research was conducted by digital signal conditioning consisting of detrend signal and lowpass filter. Testing tools have been done by measuring the blood pressure on the 30 respondent and see the relationship between blood pressure with the value of amplitude systole and diastole.

The test results showed that the intensity of the light received by the phototransistor is represented by amplitude values of systolic and diastolic on PPG which will change along with transformation in systolic pressure and diastolic pressure. It follows the equation $y = 2,2334 x - 110,67$ for systolic pressure and $y = 18,674 x - 1680,6$ for diastolic pressure. Values accuracy and precision of the tool for systolic pressure was 97.24% and 99.95%, and for diastolic pressure was 94.19% and 99.88%. From the results, it can be concluded that the tool has been designed to work well for measuring systolic pressure and diastolic pressure.

Keywords: Photoplethysmography, blood pressure, systole, diastole