ABSTRACT

Pre-screening in low and middle-income countries has been recommended by the World Health Organization(WHO) to prevent cervical cancer. The screening could be done with human papilloma virus(HPV) and Visual Inspection with Acetic Acid(VIA). The VIA test is a visual assessment test in detecting cervical lesions that turn white while exposed to 5% acetic acid. Disadvantage of VIA test is it's limited with low specificity, high inter-observer variability, and lack of image capture. Portable kolposkops are widely used to apply VIA test. The challenges on VIA test using portable kolposkop itself are the quality of acquired as the images generated from these kolposkops tend to have higher prevalence of specular reflection. Those reflections on the surface of cervix area would reduce the accuracy of the test due to the reflections that hide the informations on the area.

We proposed a solution for low-cost portable kolposkop to overcome high prevelance of specular reflection without really reducing the quality of the image. The proposed method of portable kolposkop has additional adjustable lighting to reduce the glares and reflections found on the cervix area. We also applied cross-polarizing filter to both the lighting and camera to our solution. It consists embedded system which integrated with mobile application for realtime display and user interface. With the integration of moble application in smartphone, it require less cost as it removes the needs of LCD display and also reduce the power consumption. Smartphone integration could also reduce the processing tasks done by the microcomputer that would also remove the needs for high-end processor inside the portable kolposkophardware. The integration with smartphone mobile application give more flexibility for further development

The testing result of our solution showed the capability of reducing averagely 92.44%. The video stream sent through wifi from the portable kolposkop displayed on the smartphone screen in real-time with frame rate range from 15 to 21 FPS. The battery of the portable kolposkop last within 5 hours long while being used. To operate the portable kolposkop, it needs at least 31 second for booting time.

Keywords: Kolposkop, Portabel, Cervix, Cancer