



## Design and Development of 3D Face Mask Clips for Hijab

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### ABSTRACT

The world has suffered from a critical shortage of Personal Protective Equipment (PPE) (Riva et al., 2007) during the pandemic of Covid-19 for medical staffs, the front liners. Like the whole world, Malaysia also imposed the stay-at-home and Movement Control Order (MCO) to break the chain of infections and flatten the curve of cases. The supply of PPE became a challenge during the lock down. There have been joined efforts from various parties stepping up, with different ways to help the production process of these key equipment but mostly focus on PPTs for male. Another challenge was face mask for Muslim lady health workers who wear hijab. This paper is about how to overcome these challenges and designed a novel face mask clip for hijab, using 3D printing. The face mask clip is for wearing a mask over hijab and is designed by generating a 3D digital file using computer-aided design (Hourcade, Bullock-Rest, & Hansen, 2012) software. Then the 3D design was converted to Standard Tessellation Language (STL) format, for the use of 3D printing systems. Then the design was split into layers for precise printing. The clips were tested by the staff in faculty of Cognitive Sciences and Human Development, Universiti Malaysia Sarawak. Feedbacks were collected by an online survey using the modified System Usability Scale. The participants reported that the clips are very comfortable and easy to use.

**Keywords:** Covid-19; Personal protective equipment; Pandemic; Movement Control Order; 3D Face mask

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### INTRODUCTION

Malaysia has now increased its capacity of diagnostic testing (World Health Organization, 2020a). Hospitals on the other hand, are still slammed with flooding patients coming in and out with different health status. Many of those are at risk of getting infected or even infecting others with Covid-19. As the Covid-19 virus is proven to be mainly spread

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