Evaluating the performance of locally manufactured cloth face masks (Kammamh) in achieving comfort and protection

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Abstract:
Fabric facemasks (Kammamh) are one of the precautionary measures in preventing or slowing the spread of respiratory infection. They are also considered as an alternative to physical distancing and other preventive measures, as the US Centers for Disease Control and Prevention (CDC) recently recommended the use of homemade Fabric face masks for public, because it helps reduce the spread of viruses in places where physical distancing is difficult, such as public transport and shopping places www.cdc.gov. Research problem: Do fabric facemasks widespread in the local market achieve comfort and protection properties when used to reduce exposure to respiratory infection.? Research aims: 1 - Evaluating the performance of locally manufactured fabric face masks in achieving comfort and protection from exposure to respiratory infection 2 - Knowing the most suitable locally manufactured fabric facemasks while ensuring comfort and protection. Research Methodology: The research followed the experimental method that represented in conducting laboratory tests on the samples under study for the comfort properties (weight - air permeability - softness) and protection properties (moisture absorption - wet resistance - formaldehyde ratio) Results: The performance of the fabric facemasks was evaluated based on the statistical analysis, and the results were presented graphically for the comfort and the protection properties. Contrast and the coefficient of variation were used which are two very important measures to measure the dispersion of the results. An ANOVA test was carried out to find out the effect of independent factors on the comfort properties and protection, the most important results were: 1. There is a very large variation between the results of the comfort and protection properties of all fabric samples. 2. The weight of some facemasks made of fabric is very heavy, and it has reached (9) times the weight of a medical facemask, and this has a negative impact on comfort when using it. 3. The sharp variation in air permeability values negatively affects both comfort and protection. 4. The weaving structure of the fabric facemasks has no significant effect on the air permeability property due to the fabric facemasks being manufactured from more than one layer. 5. The number of layers of fabric facemasks does not have a significant effect on the air permeability due to the difference in weight of facemask fabric square meter. 6. The outer layer of all fabric facemasks is not wet resistant and the inner layer is not absorbing liquids which helps the spread of infection from the infected person to the healthy person. 7. Some of the fabric facemasks that are widespread in the local market may not be suitable for children because the formaldehyde levels are higher than the permissible for the cloth that comes into contact with the skin of children.

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