A Novel Mask Insert to Reduce Habitual Particle Transmission

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The CDC recommends that people wash their hands before and after touching their mask, and only touch it by the ear loops. However, as masks have become ubiquitous over the past year, it has become evident that many people have developed a habit of touching their mask, which could potentially contribute to the spread of particles, including those that cause COVID-19. To solve this problem, a novel device was created to help users remember not to touch their masks. The device is inserted into the filter pocket of a cloth mask and uses capacitive sensing technology to detect the proximity of a hand to the mask, triggering a vibrating motor to alert the user. Participants were recruited from a high school population and asked to test the device in a matched-pairs experiment where each participant wore a mask with the device for one trial and a mask with the vibrating function disabled as a control trial. The device reduced the frequency of face touching from an average of 8.3 touches per hour to 4.3 touches per hour ($p=0.078$). Masks with the device were statistically no different in comfort and other subjective factors compared to the subjects' preferred masks, and the subjects demonstrated no overall preference between masks with and without the device. By reducing users' mask-touching habits, this device could successfully reduce the spread of COVID-19 and other illnesses, and could have long-term applications in other hygiene-sensitive environments such as restaurants or hospitals, even after the pandemic.

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