Letter to Editor

Quantitative Fit Test of Double Layer Surgical Masks

Thosporn Ekpreechakul, MD, MSc[1] ; Wiphasiri Saiphiroonthong, MD, MSc[1] ; Warut Chaiwong,BSc, MPH[2]

[1] Occupational Health Center, Bangkok Hospital Headquarters, Bangkok , Thailand.
[2] Bangkok Health Research Center, Bangkok Dusit Medical Services (BDMS), Bangkok , Thailand.

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Dear Editor,

We presented our findings on quantitative fit factors of various respirators and masks and emphasized on both quality of materials and sealing or fitness of respirators and masks.[1] When the second epidemic of SARS-CoV-2 emerged in Thailand in late 2020, a concern was raised on the shortage of personal protective equipment (PPE) supply, in particular N95 respirators and high performance face masks. A related question was also raised whether using double layers of surgical masks would improve performance adequately. We, therefore, conducted another quantitative fit factor assessment by Porta Count model 8048, TSI Incorporated, Minnesota, USA,[2] following OSHA (Occupational Safety and Health Administration) protocols[3] to assess fit factors of double layers of surgical masks, with single sealing and double sealing in comparison with single layer with single sealing with micropore tape. Here are the results (Table 1).

Double layers of surgical masks performed better than single layer, but not adequate, and they must be sealed twice. Single sealing of double layers of surgical masks had similar fit factors as single layer. We also found low fit factors of online purchased cloth mask, regardless of sealing. The findings corroborate with the previous study that both materials and preventing leakage are critically important for the performance of surgical masks in SARS-CoV-2 prevention. Thus, respiratory fit testing is strongly recommended.

Table 1: Fit factors of double layers of surgical masks.

Tested item	Fit factors	Remarks
1. Surgical mask – single layer with single sealing	15	Baseline
2. Surgical mask – double layers with single (externally) sealing	14, 13	Idea testing
3. Surgical mask – double layers with double (layer by layer) sealing	47, 39	Idea testing
4. Online purchased cloth mask[4] – not sealed	3	New material testing
5. Online purchased cloth mask – sealed	5, 4	New material testing

References

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