

**TITLE:** *IN VITRO* PILOT STUDY ON THE EFFECTIVENESS OF SURGICAL AND TEXTILE MASKS AS A BARRIER TO FUNGAL AIR CONTAMINATION

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**ABSTRACT:** Masks have the function of minimizing the risks of transmission and acquisition of etiological agents of respiratory diseases and had their visibility increased due to the pandemic caused by the novel coronavirus. Some factors such as the scarcity of surgical masks made the use of textile masks an alternative. However, there are gaps in the scientific literature regarding the standardization of production and effectiveness in preventing respiratory infections. The aim of this study was to evaluate the effectiveness of different types of masks as a barrier against fungal air contamination. The M Air T<sup>®</sup> equipment (Merck Millipore, Germany) was used to collect 1000L of air per sample. The fitting of the masks to the equipment was performed using a 10cm diameter and 23.5cm high polyvinyl chloride (PVC) tube coupled to a micro-perforated sieve. Air sample collections were divided into three experimental groups: group 1, without the use of masks; group 2, using triple layer surgical masks; and group 3, using double-layer 100% cotton fabric masks. Collections were performed in triplicate for each experimental group. All collections were carried out in an environment with dimensions of 340x295cm, without flow/movement and the presence of people. Plates with Sabouraud Dextrose Agar (BD, Sparks, Le Pont de Claix, France) were attached to the equipment and used to assess the fungal load in the air. After the collection period, the plates were incubated at 23°C for 72 hours. The numbers of colony forming units (CFU) of fungi were counted and the results were tabulated and analyzed according to descriptive statistics. Moreover, fungal identification was performed by macroscopic and microscopic morphologies. Group 1 showed a mean fungal load of 51.3CFU/1000L by *Aspergillus* spp., *Fusarium* spp. and *Paracoccidioides* spp. On the other hand, groups 2 and 3 demonstrated a reduction in fungal load when compared to group 1 with the absence of fungal growth and an average of 1.0CFU/1000L of air, respectively. The results of this study showed that surgical and textile masks acted as a barrier to fungal air contamination. However, it is noteworthy that the protocols related to the use of masks must be followed and that factors such as reuse, reprocessing and time of use can reduce their effectiveness as a barrier to microbial contamination.

**Keywords:** air quality control; facial masks; fungi; infection control.

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