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Herbal mask: A protective measure for COVID-19

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Abstract

Microbes can multiply on textiles and carried by it. Antimicrobial textiles could prevent itself from the transmission of infections. Antimicrobial textile can be prepared by impregnation, starching, fiber mass treatment and microencapsulation. Microorganisms can cause health hazards so it becomes important to finish garment with substances which can prevent the growth of microorganisms. Technical textiles used for medical applications are known as Medical textiles or Medtech. The application of medical textile includes usual wound care, incontinence pads, plasters, single thread sutures and complex composite structures for bone replacement, simple cleaning wipe, advanced barrier fabrics used in operating rooms. In medical and surgical applications, strength, flexibility and moisture (sometimes) and air permeability parameters are required. Absorbency, tenacity, flexibility, softness and at times bio-stability or biodegradability are major requirements of medical textiles. Fibers, yarns, fabrics and composites are used for medical applications. The common cold is an acute illness of upper respiratory tract with early symptoms of headache, sneezing, chilliness, and sore throat and later symptoms of nasal discharge, nasal obstruction, cough, and malaise. The reason behind common cold is Human Rhinoviruses, Corona virus and Influenza virus. Viral colds may be life-threatening for vulnerable groups of patients. Virus-specific management remains a challenging potential as many factors have to be taken into account, including the diversity of the viral genomes. In the present study, masks are prepared using cotton fabric, microencapsulated with *Ocimum basilicum*. It was found out that these masks were effective measure against airborne disease such as COVID-19 disease. Out of total respondents, 100% respondents did not found any side effect of treated mask; fragrance of basil is found to be effective against cold.

Keywords: Herbal mask, *Ocimum basilicum*, COVID-19, microencapsulation, antimicrobial textiles

Introduction

Technical textiles used for medical applications are known as Medical textiles or Medtech. The application of medical textile includes usual wound care, incontinence pads and plasters single thread sutures and complex composite structures for bone replacement, simple cleaning wipe, advanced barrier fabrics used in operating rooms. In medical textiles strength, flexibility and moisture(sometimes) and air permeability parameters are required. Absorbency, tenacity, flexibility, softness and at times bio-stability or biodegradability are major.



Fig 1: *Ocimum basilicum*

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requirements of Medical textiles. Fibers, yarns, fabrics and composites are used for Medical textiles. Microbes can multiply on textiles and carried by it. Microorganisms can cause health hazards so it becomes important to finish garment with substances which can prevent the growth of microorganisms. The first real, premeditated, microbiological warfare happened in 1763, during the Anglo-French wars in North America, when Native American emissaries were given blankets or handkerchiefs contaminated with smallpox. Thus, a small epidemic started and spread rapidly, causing considerable damage to the rank and file of the Native Americans. Nowadays, it could be said that textiles could be vectors of infections in hospitals or communities. Antimicrobial textiles could prevent itself from the transmission of infections. (Freney J. and Renaud F., 2021) ^[1]. Antimicrobial textile can be prepared by impregnation, starching, fiber mass treatment, and microencapsulation (Freney J. and Renaud F., 2021) ^[1]. Encapsulation has allowed moisturizers, therapeutic oils, and insecticides to be incorporated into fabrics. Microencapsulation of antimicrobial agents is also gaining popularity in sportswear and medical textiles (Umer H., 2011). The common cold is an acute illness of upper respiratory tract with early symptoms of headache, sneezing, chilliness, and sore throat and later symptoms of nasal discharge, nasal obstruction, cough, and malaise. The reason behind common cold is Human Rhinoviruses, corona virus and Influenza virus (Hendley, J.O., 2021) ^[3] Generally the severity of symptoms increases rapidly, peaking 2–3 days after infection, with a mean duration of symptoms of 7–10 days but with some symptoms persisting for more than 3 weeks. Studies on the symptoms generated by different common cold viruses indicate that it is not possible to identify the virus on the basis of the symptoms, since similar symptoms are caused by different viruses. Specific diagnosis and treatment of the common cold still remain unmet needs. Viral colds may be life-threatening for vulnerable groups of patients. Virus-specific management remains a challenging potential as many factors have to be taken into account, including the diversity of the viral genomes, the heterogeneity of affected individuals, as well as the complexity of this long standing host-virus relationship.

Methodology

The present study aimed at microencapsulation of cotton fabric (cellulosic fabric) using Basil (*Ocimum basilicum*). Before the application of finish fabric was pretreated to remove the impurities like fats and oil. These impurities were removed by using scouring treatment on cotton fabric. Cotton was procured from local market. Scouring of cotton was done using sodium carbonate 2g/l, detergent 5 g/l for 30 minutes at 50-60 °C. Scouring was done by method given by Shenai V.A., 1976 ^[4]. Material liquor ratio was kept 1:30. Under the present study *Ocimum basilicum* was selected as core material according to their easy availability and effective against cold. Scanning electron microscope JSM-6610LU (SEM) was used to ensure microcapsules presence in the fabrics. From treated fabric, Herbal masks were prepared. In the present study, sample size chosen was 100. Respondents were taken from Udham Singh Nagar district of Uttarakhand, which was consisted of professors, teachers from Primary school, Junior High school and Inter College, doctor, engineers, senior research fellows, managers, Non-teaching staffs, shopkeepers, auto-rickshaw drivers and students of schools, colleges and universities and housewives. Selection of respondents were

done randomly and were given masks to wear for 15 days. Attitude scale was developed to analyzed the effect of aromas on the ultimate consumer as given by Bhatia, A and Sharma, R.K. Survey method was followed to conduct the study. Each respondents were asked to fill pretest and post test questionnaire regarding the effect of aromas of *Ocimum basilicum* present in the mask.



Plate 1: Front view of mask



Plate 2: Side view of mask

Result and Discussion: Findings of the study are as follows: Respondents used mask which were microencapsulated with *Ocimum basilicum* for 15 days. After that views of respondents were obtained by collecting questionnaire filled by them. In the study it was found out that most of the respondents i.e. 58% respondents were strongly agree and 41 % respondents agree that the mask given was effective measure against airborne disease only 1% respondent disagree that the mask given was not effective measure against airborne disease. (Figure-1) It may be due to the fact that microcapsules containing an antimicrobial agent adhere to the textile using a binding agent. The textile becomes active only when the microcapsules are broken while wearing them.

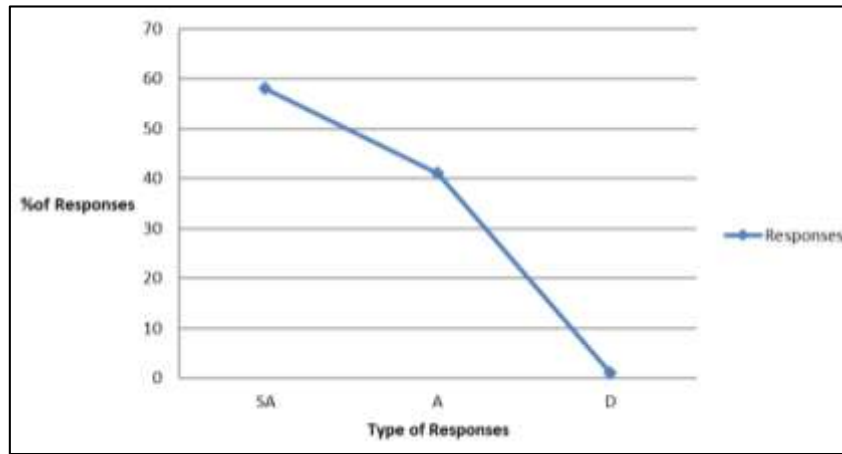


Fig 1: Percentage of respondents, considered masks as a protective measure against airborne disease

Garment (Freney J. and Renaud F., 2021) [1]. It is evident from figure-2 that 47% respondents were strongly agree and 49% respondents agree that masks treated with basil protect

us against disease like cold, only 4% respondents were not agree that masks treated with basil protect us against disease like cold. (Figure-2).

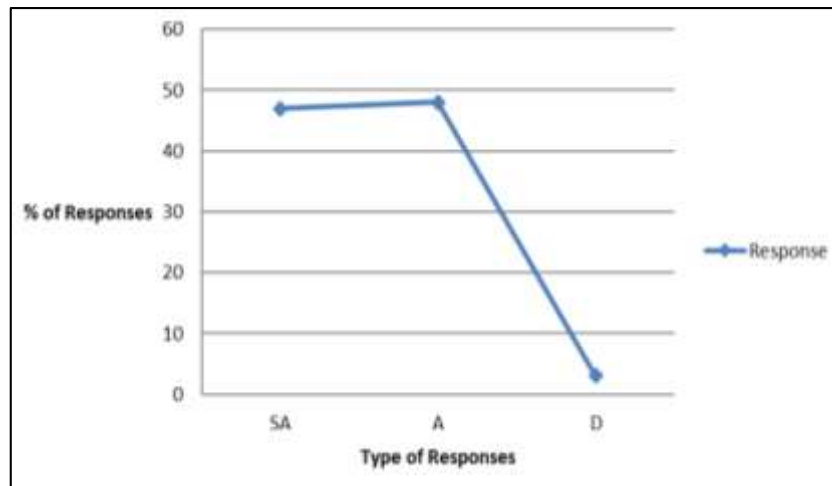


Fig 2: Percentage of respondents, considered mask as protective measure against disease like cold

It is due to the fact that traditionally basil had been used to treat headaches, coughs, diarrhoea and kidney malfunctions (Balakrishnan P. *et al*, 2018) [5]. Most of the respondents i.e. 58% respondents were strongly agree and 38 % respondents were agree that the masks treated with *Ocimum basilicum*

play a major role in protecting us from COVID-19 disease while a minimum number of repondents i.e. 4% respondents disagree that the masks treated with *Ocimum basilicum* play a major role in protecting us from COVID-19 disease. (Figure-3).

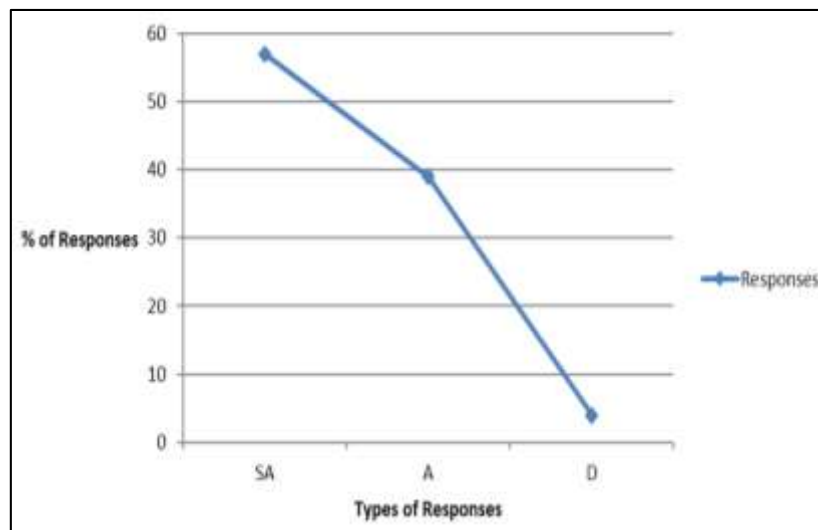


Fig 3: Percentage of respondents, considered masks treated with *tulsi* had major role in protecting us from COVID-19 disease

It was due to the reason that “Common cold” and “flu” are syndromes of familiar symptoms caused by viral infection of the upper respiratory tract. Rhinoviruses account for 30–50% of all colds, and Corona viruses were the second most

common agent, accounting for 10–15% of colds. Influenza viruses account for 5–15% of colds, and cold viruses such as respiratory syncytial virus were responsible for much flu-like illness (Ron E., 2005).

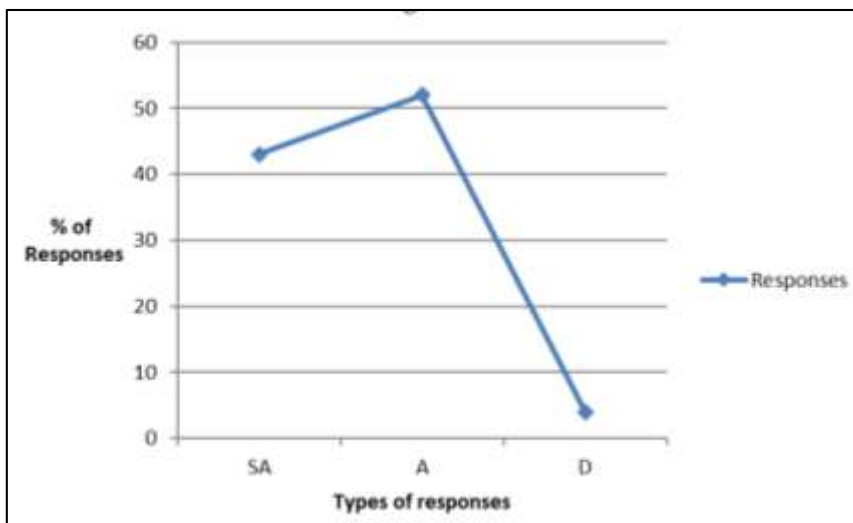


Fig 4: Percentage of respondents, considered basil is effective against cold

Out of total respondents surveyed most of the respondents i.e. 43% respondents were strongly agree and 53 % respondents were agree that basil is effective against cold, a minimum of respondents i.e. 4% respondents disagree that basil was effective against cold.(Figure-4)It was due to the fact that essential oil had many useful properties. It was supported by the study in which essential oils were used

to treat snoring. It was found that 82% patients using the help stop snoring spray had a reduction in snoring,71% using the gargle had a reduction in snoring. Maximum respondents i.e. 33% respondents were strongly agree and 49 % respondents agree that fragrance of mask relatively decreased after 15 days, only 18% respondents disagree that fragrance of mask relatively decreased after 15 days. (Figure 5)

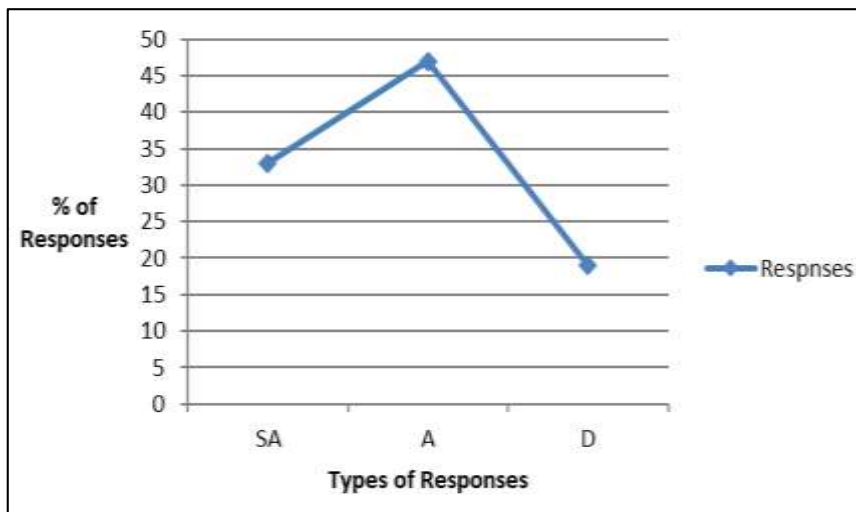


Fig 5: Percentage of respondents, considered fragrance of mask relatively decreased after 15 days

Maximum number of respondents i.e. 38% respondents were strongly agree and 51% respondents agree that they were ready to pay additional cost for the mask having medicinal properties or immunity booster properties and health enhancing capabilities.(Figure 6) It was supported by the study conducted by in which it was found out that respondents

were willing to pay 30% more for products made using aroma therapeutic fabric (Agarwal, M. 2010) [7]. Most of the respondents i.e.59% respondents were strongly agree and 41 % respondents agree that they did not find any side effect of this mask during use.

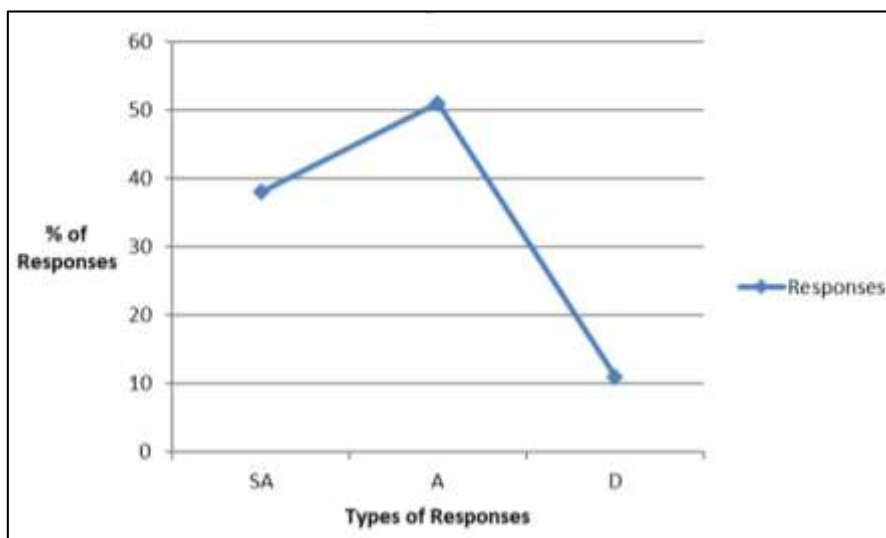


Fig 6: Percentage of respondents, ready to pay additional cost for the mask

All respondents (i.e.100%respondents) were agree on the point that did not found any side effect of mask treated with

basil. (Figure7). It may be supported by the study conducted by.

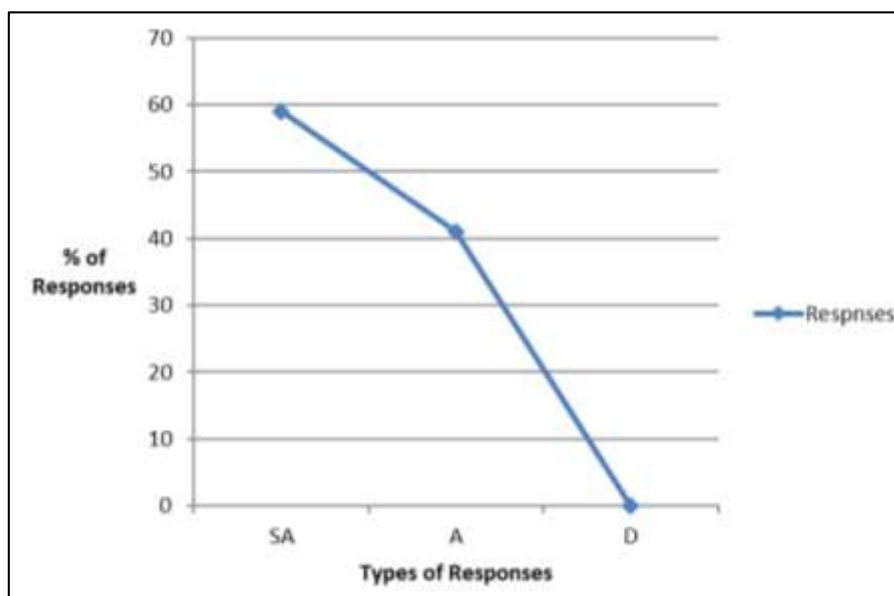


Fig 7: Percentage of respondents did not had any side effect of mask

Jamshidi, N. and Cohen, M.M. 2021 ^[8] in which review studies were conducted on clinical effects of tulsi and it was found that all reviewed studies reported favourable clinical effects with minimal or no side effects irrespective of dose, formulation, or the age or gender of participants, with only one clinical trial reporting transient mild nausea. As the longest study was only 13 weeks, the failure to report any adverse effects does not preclude the presence of any long term side effects; however, the long traditional history of regular tulsi use suggests any serious long term effects are unlikely and that daily ingestion of tulsi is safe.

Conclusion

It can be concluded from the present study that masks treated with *Ocimum basilicum* was effective measure against airborne disease such as COVID-19 disease. It was found that mask treated with basil protect us from disease like cold. It was found that basil is effective against cold. It was found out that masks prepared using basil oil had immunity booster properties and, also it had no side effects and people would

prefer to purchase masks for health benefits.

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