

Personal Protective Equipment used for Infection Control in Dental Practices

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ABSTRACT

The potential size of India's dental market is vast and is expected to become one of the largest single country markets for overseas dental products and materials. The total market for the dental equipment and materials is estimated to be around US\$ 90 million annually. There are more than 1, 80,000 dental professionals in India, 297 dental institutes and over 5,000 dental laboratories. Thus, there is a huge potential for the market of personal protective equipment (PPE) used for infection control in dentistry. India's market for dental products is extremely dynamic, with a current estimated growth rate of between 25 and 30%. Overall, the dental market is expected to grow by 20%.¹

The personal protective equipment used in the practice of dentistry in India. Since dentistry is predominantly a surgical discipline, it leads to exposure to the pathogenic microorganisms harbored in blood, body fluids and other potentially infectious material. Thus, the use of adequate and good quality PPE is imperative for infection control in dental practice. With the growing potential of India's dental market, the growth of the market for PPE is inevitable. But, it is equally important to raise the awareness among dental community about good quality products adhering to required standards to prevent the usage of low-cost, uncertified and sub-standard products that decrease the safety levels of personnel.

The present study is conducted with a view to observe the personal protective equipment used for infection control in dental practices.

Keywords: Personal protective equipments, Infection control, AAMI standard, Dental practice.

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INTRODUCTION

Exposure to the pathogenic microorganisms harbored in blood, body fluids and other potentially infectious

material (OPIM) can lead to occupationally acquired infections (OAI) in healthcare workers (HCWs). That is why it is critical that healthcare providers don key pieces of personal protective equipment (PPE) and understand the levels of barrier protection these PPE items can afford them in patient-care and surgical situations.

The association for the advancement of medical instrumentation (AAMI) standard, 'Liquid Barrier Performance and Classification of Protective Apparel and Drapes Intended for Use in Health Care Facilities' (ANSI/AAMI PB70), has served as the gold standard for the manufacturing of medical gowns' barrier performance, which is key in preventing fluid and microbial strike through—a contributor to occupationally acquired infections. The AAMI standard addressed the issue raised by the occupational safety and health administration's (OSHA) standard on occupational exposure to bloodborne pathogens, which mandated that the employer provide the HCW with protective apparel that is commensurate with the task and degree of exposure anticipated. In addition to strikethrough, the standard addresses parameters for flammability resistance and linting, which can serve as a carriage vehicle for microbial particles.

At the heart of this AAMI standard are the four levels of barrier protection, ranging from level one, which is the lowest level of protection, to level four, which is the highest level. Utilizing these classification levels, manufacturers are able to label their products according to the level of protection their product provides, and HCWs can more easily select the appropriate barrier they need. All gowns and surgical drapes are subject to this classification system.

Personal Protective Equipment used in Dentistry

Personal protective equipment is designed to protect the skin and the mucous membranes of the eyes, nose, and mouth of dental healthcare personnel from exposure to blood or other potentially infectious material. Occupational safety and health administration mandates that dental HCWs wear gloves, surgical masks, protective eyewear, and protective clothing in specified circumstances to reduce the risk of exposures to bloodborne pathogens.^{2,3}

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Factors influencing Selection of Personal Protective Equipment

A number of factors affect the selection of PPE. These are:

- The first involves the nature of the exposure anticipated—contagious, heat or chemicals. Is the PPE reasonable, necessary, and appropriate for the hazard?
- Fit is also important when it comes to PPE since comfort improves compliance.
- Biocompatibility
- Longevity
- Style, fashion
- Cost

Indian Market for Personal Protective Equipment

Increasing awareness among end users about improving the safety standards of their employees and safety against occupational hazards opens up opportunities for manufacturers of PPE.^{4,5}

However, low-cost, uncertified and sub-standard products that decrease the safety levels of personnel and erode the market shares of certified PPE manufacturers currently dominate the market. The high price sensitivity among end users discourages market growth in terms of revenues. Further, no incentives are available for those who adopt high quality product offerings. Some end users even tend to re-use disposable PPE, especially protective clothing and gloves. 'The Indian PPE markets' foremost challenge is to create more awareness among end users about the correct PPE products—especially protective gloves—to be used in various industries. Lack of enforcement of government's occupational and safety regulations only reduce the potential of the total PPE market. Hence, PPE manufacturers face the responsibility to encourage industries to invest in certified quality products despite the products' high price.

AIM OF THE STUDY

The aim of the study is to identify PPE used by dental doctors in India.

OBJECTIVES

- To study the factors affecting the selection of PPE by dental doctors.
- To study how the PPE manufacturers face the responsibility to encourage industries to invest in certified quality products despite the products' high price.

SCOPE OF THE STUDY

The scope of the study is limited to the disposable items used by the dental doctors for personal protective methods while managing their patients.

MATERIALS AND METHODS

This paper is based on a survey conducted amongst 70 dental practitioners in Pune and Thane regions using tools of data collection such as observation, questionnaire, and personal interviews, etc. to gauge the current trends of PPE dominating the Indian market and the factors influencing the purchase of PPE by the dental practitioners.

Tools of data collection: Questionnaire, observations, personal interviews with practitioners.

Factors influencing the Purchase of Personal Protective Equipment by the Surveyed Dentists

The results of a factor analysis with ten probable factors influencing the purchase decisions of dentists pertaining to PPE revealed the following outcome:

Cost effectiveness of the product: Derived by clubbing together cost of the material, availability of discounts + reusability of the product.

Quality of the product: Derived by clubbing together comfort whiles using the product + no itching or allergy on usage of the product.

Fit for purpose: Derived by clubbing together the factors of high resistance to fluid exposure and compatibility with the methods of sterilization such as steam and ethylene oxide.

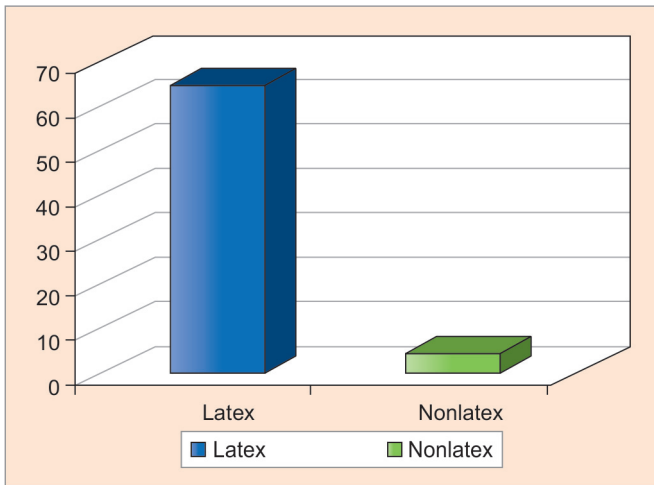
These factors are probably the ones exerting a high degree of influence on the purchase of PPE by dentists.

Challenges faced by the Indian PPE market are as follows:

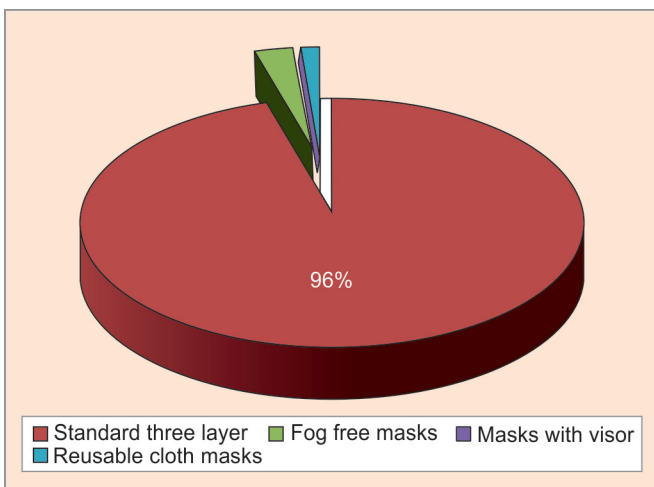
- Lack of established infection control and prevention guidelines and standards.
- Low-cost, uncertified and sub-standard products that decrease the safety levels of personnel and erode the market shares of certified PPE manufacturers currently dominate the market.⁵
- High price sensitivity among end users.
- Lack of incentives for those who adopt high quality product offerings.
- Low awareness among end users about the correct PPE products—especially protective gloves—to be used in various industries (Graphs 1 to 3).
- Lack of enforcement of government's occupational and safety regulations only reduce the potential of the total PPE market (Graphs 1 to 3).

RECOMMENDATIONS

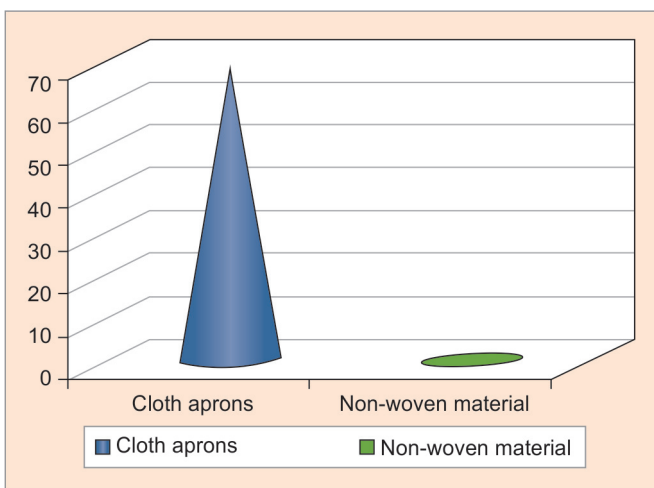
- Manufacturing and supplying a diverse range of products to cater to various price segments.⁵
- A well-planned distribution network will further ensure that the products reach the right end users.



Graph 1: Gloves used by survey participants



Graph 2: Face masks used by survey participants



Graph 3: Protective gowns used by survey participants

- Introduce training initiatives with superior quality PPE at dental institutes and lectures and conferences

for continued dental education conducted by bodies, such as Indian Dentists Association, to increase awareness about the products of high standards.

- Invest in branding
- Set up a consortium/organization to initiate stringent enforcement of safety standards.

CONCLUSION

As dentistry is predominantly a surgical discipline, it is imperative to practice stringent measures of infection control. Exposure to the pathogenic microorganisms harbored in blood, body fluids and OPIM can lead to OAIs in HCWs. To protect the HCWs, it is important to use good quality PPE designed to match the requirements of HCWs and adhering to standards, such as the AAMI guidelines. It is also of significance to increase the awareness among HCWs about the standards of infection control that should be followed at their dental clinics and to introduce training initiatives with superior quality PPE to ensure personnel and patient safety. Thus, the need of the hour is to enforce and implement superior measures of infection control to improve the practice of dentistry in India.

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