Cogitare Enfermagem

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USE OF FACE MASKS: INDICATIONS FOR USE AND HANDLING DURING THE COVID-19 PANDEMIC

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ABSTRACT

Objective: To discuss the correct use, indications for use, effectiveness and handling of the different types of mask, as well as suggest, based on scientific evidence and recommendations from health agencies, effective ways to increase the useful life of this product.

Method: Narrative literature review using articles from the PubMed, Scopus and Web of Science databases, and recommendations from health agencies conducted in April 2020.

Results: Protective respiratory devices (particulate respirators) can be reused if it is clean, dry and their layers and shape are intact. To increase the durability of surgical masks, the use of paper towels to absorb moisture is suggested. Cloth masks are recommended, as long as they are washed properly for reuse.

Conclusion: Despite the scarce number of studies on the reuse of masks, given the expansion of COVID-19 and the worldwide shortage of this equipment, health professionals and the population must be constantly updated on the recommendations for use of these protective devices.

DESCRIPTORS: Covid-19; Masks; Respiratory Protective Devices; Respiratory Tract Infections; Nursing.

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UTILIZAÇÃO DE MÁSCARAS: INDICAÇÕES DE USO E MANEJO DURANTE A PANDEMIA DA COVID-19

RESUMO
Objetivo: discutir a forma correta de utilização, indicações de uso, eficácia e manejo de cada tipo de máscara, assim como sugerir, conforme evidências científicas e recomendações de órgãos de saúde, alternativas eficazes para aumentar a vida útil deste produto.
Método: revisão narrativa utilizando artigos provenientes das bases de dados PubMed, Scopus e Web of Science, e recomendações de agências de saúde. Realizada em abril de 2020.
Resultados: máscaras de proteção respiratória podem ser reutilizadas se estiverem íntegras, limpas e secas. Para aumentar a durabilidade de máscaras cirúrgicas, sugere-se a utilização com papel toalha para absorver a umidade. Máscaras de tecido são recomendadas, desde que sejam lavadas adequadamente para reutilização.
Conclusão: embora necessitem estudos sobre o reaproveitamento de máscaras, com a expansão da COVID-19 e a escassez mundial deste equipamento, torna-se essencial que os profissionais da saúde e a população se mantenham atualizados a respeito das suas recomendações de uso.

DESCRITORES: Covid-19; Máscaras; Dispositivos de Proteção Respiratória; Infecções Respiratórias; Enfermagem.

UTILIZACIÓN DE MASCARILLAS: INDICACIONES DE USO E MANEJO DURANTE LA PANDEMIA DE COVID-19

RESUMEN:
Objetivo: discutir la forma correcta de utilización, indicaciones de uso, eficacia y manejo de cada tipo de mascarilla, además de sugerir, de conformidad con las evidencias científicas y recomendaciones de los órganos de salud, alternativas eficaces para aumentar la vida útil de este producto.
Método: revisión narrativa con utilización de artículos provenientes de las bases de datos PubMed, Scopus e Web of Science, y recomendaciones de agencias de salud, realizada en abril de 2020.
Resultados: las mascarillas de protección respiratoria pueden ser reutilizadas siempre que se encuentren limpias y secas, en tanto y en cuanto mantengan su integridad. Para aumentar la durabilidad de las mascarillas quirúrgicas, se sugiere su utilización con papel absorbente para absorber la humedad. Las mascarillas de tela son recomendables, siempre y cuando se laven adecuadamente para reutilización.
Conclusión: aunque sean necesarios estudios acerca del reaprovechamiento de los barbijos, con la expansión del COVID-19 y la escasez mundial de este producto, es imprescindible que, tanto los profesionales de la salud como la población en general, se mantengan actualizados sobre sus recomendaciones de uso.

DESCRIPTORES: Covid-19; Máscaras; Dispositivos de Protección Respiratoria; Infecciones del Sistema Respiratorio; Enfermería.

INTRODUCTION

The novel coronavirus, named Severe Acute Respiratory Syndrome Coronavirus 2 (Sars-CoV-2), as well as the disease caused by the virus (COVID-19), were first detected in China, in December 2019 [1]. Due to its rapid transmission and high mortality rates, the disease was characterized as a pandemic by the World Health Organization (WHO) on March 11, 2020 [2]. By May 10, 2020, 4,013,728 cases and 278,993 deaths had been confirmed [3].

Human-to-human transmission can occur even in the absence of symptoms [4]. The disease is transmitted mainly through infective respiratory droplets that come into contact with the mucosae (mouth and nose) or conjunctiva (eyes) of healthy individuals. Transmission can also occur by direct contact, when the virus is present on the surfaces [5]. The Sars-CoV-2 virus has an estimated average life of approximately 5.6 hours on stainless steel surfaces and 6.8 hours on plastic surfaces, it can remain for up to 72 hours. On the other hand, in copper and cardboard, although these materials can be considered fomites, viable viruses were not detected after 4 hours and 24 hours, respectively [6].

The diagnosis of Covid 19 can be clinical or laboratory [7]. Clinical diagnosis is made through clinical-epidemiological investigation and physical examination. Laboratory diagnosis uses samples collected from the upper respiratory tract (nasopharyngeal and oropharyngeal swab) and lower respiratory specimens (sputum (if produced), endotracheal aspirate or bronchoalveolar lavage) from individuals infected or suspected of Covid-19[8]. The gold standard technique is RT-PCR - Reverse Transcription Polymerase Chain Reaction. However, rapid serological tests validated by reference institutions can also be used [7].

Due to the lack of specific drugs or vaccines, non-pharmacological measures are necessary to control the spread of infection [9], such as hand hygiene (washing hands with soap and water) or the use of an antiseptic gel based on 70% ethyl alcohol. On the other hand, the cleaning and disinfection of surfaces/locations such as public environments, supermarkets, hospitals, can be carried out with products based on ethanol (62-71%), as well as hydrogen peroxide (0.5%) or sodium hypochlorite (0.1% - (one tablespoon of household bleach to one liter of water). Other necessary measures include the use of Personal Protective Equipment (PPE) and early detection and notification of cases [10].

It is also important to adopt the three classic public health measures, which have been used for a long time in the control of epidemics, but still generate doubts in the population[11], namely, isolation of contaminated and household contacts for 14 days; quarantine, with restricted movement of people exposed to a contagious disease who are not infected or in the incubation stage; and social distance, by reducing interactions between people in a community, as many individuals may be infected, even if they have not been diagnosed [11].

Although the COVID-19 pandemic generally produces similar effects on the human population, variations occur according to each country, and new measures must be adopted, which causes controversy [12]. One measure is the use of face masks by health professionals and the general population. The reason for this controversy is the shortage of masks in factories in many countries [13].

Thus, this narrative literature review tried to discuss the correct use, indications for use, effectiveness and handling of the different types of masks, as well as suggest, based on scientific evidence and recommendations from health agencies, effective ways to increase the useful life of these products.

METHOD

Narrative literature review that searched the PubMed, Scopus and Web of Science databases to identify relevant studies. For complementation purposes, recommendations from the National Health Surveillance Agency (ANVISA), the World Health Organization (WHO - World Health Organization) and the Center for Disease Control and Prevention (CDC) were consulted. The topics covered were how to wear the masks, the different types of mask available (protective respiratory devices, surgical, cloth), and finally, how to dispose of and reuse these items.

RESULTS

How to use the masks

Hands must always be properly washed before putting on a face mask. The material should cover both the nose and mouth and have no holes or tears. There should be no gaps between the face and the mask. Thus, elastic bands or straps should not be crossed to avoid openings. After use, the mask must be removed, which is done by removing the elastics bands over the ears or untying the straps. The front of the mask should not be touched while the item is used or removed, but if that occurs, hands should be washed again [14]. As for health professionals, they should avoid applying lipsticks or other makeup products while wearing a mask [15].

Health professionals in the front line are more prone to dry skin, which reduces the skin barrier, due to frequent antisepsis and the use of PPE for a long time. Pressure injuries, hives, contact dermatitis, dryness and worsening of pre-existing skin diseases can occur. Therefore, these professionals must adopt protective measures for the maintenance of the skin barrier, such as the use of adjusted masks, application of moisturizers or gels, in order to lubricate and reduce friction. They must pay attention to any signs of damage to the skin to carry out the appropriate treatment and avoid worsening [16].

Respiratory protective devices

Respiratory protective devices (N95, N99, N100, PFF2 or PFF3) are also known as particulate respirators. N95 respirators have the minimum level of filter efficiency: 95%. They filter up to 95% of particles down to 0.3 microns. These devices are recommended for use by healthcare workers during aerosol-generating procedures, such as intubation or tracheal aspiration, non-invasive mechanical ventilation, cardiopulmonary resuscitation, manual ventilation before intubation, collection of samples obtained by nasotracheal aspiration, bronchoscopy and other similar procedures. Use of these respirators is also recommended for the protection of workers who perform cleaning and sanitation tasks in premises where the aforementioned procedures are performed [15].

Exceptionally, in an attempt to control the use of particulate respirators to avoid wastage and lack of these devices, different countries are recommending their prolonged use or reuse [17]. In Brazil, ANVISA recommends the use of respirators for a longer period or their reuse by the same professional, provided their integrity was not compromised and they are clean and dry. It should be emphasized that the use of masks after their expiration date was not recommended, and each health service should standardize a protocol with guidance to professionals on how to reuse the devices [15].

Surgical Masks

Surgical or medical masks are recommended for a broader population in healthcare settings. It includes health workers who provide direct care to patients (when a distance of at least 1 meter from the patients cannot be maintained), as long as such care does

not include performing aerosol-generating procedures, whether in suspected or confirmed cases of infection with the novel coronavirus. They are also recommended for other hospital workers who are close to patients (less than 1 meter away from the patients) and for patients with suspected or confirmed COVID-19 respiratory symptoms, as well as their companions[15].

Despite the proven efficacy of surgical masks in terms of protection and reduction of virus transmission, one disadvantage of this PPE is its short life cycle (approximately four hours) as a result of moisture absorption [18,19]. To minimize this problem, it is suggested the use of the surgical mask with paper towel, so that it absorbs moisture. To ensure the ability of paper towel to absorb water vapor, the paper may be properly folded in half, forming a rectangle. The size of the paper towel should be adjusted according to the mouth position and within the range of the mask. The paper towel can be changed when the individual feels uncomfortable or at 30-minute intervals [20].

Cloth masks

Research on the efficacy of cloth and non-woven fabric (TNT) masks is still scarce and inconclusive [21,22]. Still, the use of these masks is being recommended for people who need to go out grocery shopping or at a pharmacy, and on public transportation, in order to reduce potential transmission of COVID-19 from the mask wearer to others.

These masks are recommended for anyone, but aspects such as mask adjustment and cleanliness should be considered, and the fact that face masks are not well tolerated by certain population groups. Also, other preventive measures, such as social distance of at least 1 meter between one person and another should not be relaxed [23]. The most commonly recommended fabrics are polyester, cotton, natural silk and chiffon, as some promising studies have already demonstrated that these fabrics can provide significant protection against the transmission of aerosol particles, although further research is needed to prove this effectiveness [24,25].

Still on the use of fabric masks, the Centers for Disease Control and Prevention (CDC) in the United States recommend that, in the absence of the handmade masks, cloth face coverings should be used by the population to cover the nose and mouth, in order to help prevent people who have COVID-19 from spreading the virus to others, mainly in asymptomatic cases. This measure is not intended to protect the user, but rather to prevent or reduce the spread of viruses from one user to another [26].

Disposal and reuse

Users of each type of mask need to know when they can be discarded or reused. As previously mentioned, N95 respirators and other similar protective respiratory devices can now be used for longer, provided their integrity was not compromised and they are clean. If the masks are not in these conditions, they must be discarded in a closed trash bin and proper hand hygiene must be performed immediately afterwards [15].

Regarding surgical and TNT masks, which are not very resistant, it is recommended they are disposed in a sealed waste bin, and that users clean their hands with 70% alcohol or water and soap[15-23]. As for non-disposable masks (made of fabric), they must be washed (not more than 30 times, as these materials were tested for 30 washes), separately from other clothes, with running water and neutral soap (use of a solution of bleach 2.5 %, 2 tablespoons bleach to 1 liter of water). Subsequently, these masks must be rinsed to remove any residue, dried, ironed with a hot iron and kept in a sealed container [23].

With the growing shortage of PPE worldwide, safe measures for reusing materials are needed [27]. One way of reusing N95 is heating the respirator to 70° C (158° F) for 30 min in an oven. For this purpose, one of the straps of the respirator must be attached by a clip to the metal grid of the oven (the other parts cannot touch the metal of the oven).

After this process, the respirator should be stored in dry conditions for 3 to 4 days to ensure the elimination of the virus. These items should not be exposed to UV light or liquid disinfectants in order to avoid damage to the structure [28].

CONCLUSION

The correct use of masks is important not only for the protection of health professionals, but also for the protection of the general population. The choice of the most suitable mask, whether manufactured or handmade, as well as its appropriate use and reuse, are key to reduce the dissemination of the novel coronavirus.

Use, recommendations and levels of effectiveness vary for the different types of face masks. Although further research is needed to prove some basic information on the reuse of these materials, due to the rapid spread of COVID-19 and global shortage of PPE, health professionals and the population must be constantly updated on local recommendations, without neglecting the use of other forms of prevention.

Further studies on this topic can help health professionals and the community understand the most efficient and rational way of using this PPE, which can be decisive to prevent infection by Sars-CoV-2.

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