

LESÕES POR PRESSÃO DURANTE A PANDEMIA DA COVID-19 PRESSURE ULCERS DURING THE COVID-19 PANDEMIC LESIONES POR PRESIÓN DURANTE LA PANDEMIA DEL COVID-19

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RESUMO

Objetivo: identificar as medidas preventivas para lesões por pressão causadas pelo uso dos equipamentos de proteção individual durante a pandemia da COVID-19. **Método** trata-se de um estudo bibliográfico, descritivo, tipo revisão integrativa cuja busca ocorreu nas bases de dados LILACS, MEDLINE e Biblioteca Virtual SCIELO. Incluíram-se artigos originais, publicados entre 2019 e 2020, nos idiomas inglês e português. Analisaram-se os achados de forma descritiva. **Resultados:** identificaram-se 203 estudos publicados em periódicos nacionais e internacionais. Seleccionaram-se 15 estudos, que avaliam a técnica de utilização dos equipamentos de proteção individual e estudos que oferecem vários tipos de cobertura/dispositivos e medidas preventivas para lesão causada pelo equipamento de proteção individual. **Conclusão:** faz-se necessário, com a exposição dos profissionais da saúde à COVID-19, que seja feita recomendação no sentido de que os gestores das instituições implementem protocolos e que os profissionais sejam treinados relativamente às técnicas corretas do uso do equipamento de proteção individual e sobre as medidas preventivas para lesões causadas pelo uso do equipamento de proteção individual e relacionadas aos cuidados com a pele antes da colocação e após a retirada desses equipamentos.

Descritores: COVID-19; Pandemias; Vírus da SARS; Lesão por Pressão; Equipamentos e Provisões; Cuidado de Enfermagem.

ABSTRACT

Objective: to identify preventive measures for pressure injuries caused by the use of personal protective equipment during the COVID-19 pandemic. **Method:** this is a bibliographic, descriptive, integrative review-type study whose search took place in the LILACS, MEDLINE and SCIELO Virtual Library databases. Original articles published between 2019 and 2020 in English and Portuguese were included. The findings were analyzed in a descriptive manner. **Results:** two hundred and three studies published in national and international journals were identified. Fifteen studies were selected, which evaluate the technique of using personal protective equipment and studies that offer various types of coverage/devices and preventive measures for injury caused by personal

protective equipment. **Conclusion:** it is necessary, with the exposure of health professionals to COVID-19, to recommend that the managers of the institutions implement protocols and that the professionals be trained on the correct techniques for the use of personal protective equipment and on preventive measures for injuries caused by the use of personal protective equipment and related to skin care before the placement and after the removal of this equipment.

Descriptors: COVID-19; Pandemias; SARS Virus; Pressure Ulcer; Equipment and Provisions; Nursing Care.

RESUMEN

Objetivo: identificar las medidas preventivas para las lesiones por presión causadas por el uso de equipo de protección personal durante la pandemia del COVID-19. **Método:** se trata de un tipo de revisión bibliográfica, descriptiva, integradora cuya búsqueda se realizó en las bases de datos LILACS, MEDLINE y Biblioteca Virtual SCIELO. Se incluyeron artículos originales, publicados entre 2019 y 2020, en inglés y portugués. Los hallazgos se analizaron de forma descriptiva. **Resultados:** se identificaron 203 estudios publicados en revistas nacionales e internacionales. Se seleccionaron quince estudios, que evalúan la técnica de uso de equipos de protección personal y estudios que ofrecen diversos tipos de coberturas / dispositivos y medidas preventivas para las lesiones causadas por equipos de protección personal. **Conclusión:** es necesario, con la exposición de los profesionales de la salud al COVID-19, que se haga una recomendación en el sentido de que los gerentes de las instituciones implementen protocolos y que los profesionales estén capacitados en las técnicas correctas para el uso de equipos de protección personal y sobre las medidas preventivas para lesiones causadas por el uso de equipo de protección personal y relacionadas con el cuidado de la piel antes de colocar y después de retirar dicho equipo.

Descriptores: COVID-19; Pandemia; Virus del SRAS; Úlcera por Presión; Equipos y Suministros; Atención de Enfermería.

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INTRODUCTION

It is known that Coronavirus first appeared in China in 2019 and was responsible for the emergence of a respiratory infection, known as COVID-19, which can range from a simple flu to very serious complications, such as pneumonia, putting the lives of infected individuals at risk.¹⁻²

It is recalled that the Chinese health authorities made the outbreak public and established public health measures in their country, including continuous epidemiological surveillance, with clinical investigations that led to the closure of the Wuhan - China City - market for environmental disinfection. On January 30, 2020, the World Health Organization (WHO) declared COVID-19 as a Public Health Emergency of Global Interest.³⁻⁴

It is transmitted to COVID-19 by respiratory secretions and saliva, being indicated to take some precautions to avoid contamination and to transmit it to other individuals, such as: cover the mouth when coughing or sneezing; wash your hands regularly and avoid touching your face, mainly in the eyes, nose and mouth area.¹⁻³ The WHO has been concerned about the spread of the disease on a global level, and has recommended measures such as hand washing, hand antiseptics with alcohol gel 70% for the general population and the use of Personal Protective Equipment (PPE) by health professionals.⁵⁻⁶

It is warned that the nursing professional, during the COVID-19 pandemic, has an increased risk of contamination due to the frequent need to perform procedures. It is added that there is also the possibility of subsequent complications, which may increase the spread of the virus as a result of certain procedures performed by him, such as tracheal aspiration and intubation. It is understood that the need for health professionals to strictly observe the precautions standardized by the Ministry of Health, aiming at minimizing transmission, emerges. It is recommended that the use of PPES be adopted by all health professionals involved in the care of patients affected by COVID-19 in health institutions, regardless of the pathology, initially suspected, or diagnosed.⁷⁻⁸

It is informed that PPEs are all devices for individual use, designed to protect the physical integrity of the worker, including gloves, eye or facial protectors, respiratory protectors, aprons and protection for the lower limbs, it cannot be ignored that hand hygiene is one of the most important standard precautions to prevent contamination and spread of the virus.

In Brazil, the Ministry of Labor requires employers to provide adequate PPES to mitigate the risks to which professionals are exposed and to conduct ongoing training on how to properly use this equipment. By incorrect use of PPES, the professional can be exposed to biological risk, which may also lead to injuries caused by medical devices.⁹

For the proper use of PPES, the professional must take into consideration not only the efficiency necessary to control the risk of exposure, but also the comfort in the use of these materials, because, if there is discomfort in the use of the equipment, there is the possibility that the professional will not use and even not incorporate it into routine practice.¹⁰

In April 2016, the National Pressure Ulcer Advisory Panel announced a change in terminology from pressure ulcer to pressure lesion, also including pressure lesion related to a medical device. This lesion results from the use of devices designed and applied for diagnostic or therapeutic purposes, appearing when the professional uses PPES and suffers skin lesions.¹¹⁻⁶

It is pointed out that the prolonged or incorrect use of facial masks, respirators and goggles/visors is responsible for the constant friction and pressure forces on the tissues, leading professionals to suffer the injuries.¹⁵⁻⁷

Nursing care for the prevention of pressure ulcers related to medical devices caused by the use of PPES should be done through daily skin examination, repositioning of the devices in order to reduce physical forces (friction, shearing, without changing the safety capacity of PPES). This can reduce the impact on tissues and improve the skin's response capacity to constant aggressions.¹³⁻⁸

The skin friction is determined by the properties of its surface (oiliness, roughness, hydration state, among others), by the properties of the materials in contact (rigid, soft, fibrous, hard, etc.), as well as by the influence of possible intermediate layers (creams, lotions, pastes, among others), combined with sweat and sebum, which are naturally excreted at the cutaneous level.

The relevance of reviewing studies focusing on pressure injuries related to medical devices caused by the use of PPES is linked to the possibility of becoming aware of the gaps in knowledge on the subject, but above all to the development of new research aimed at preventing these injuries, thereby contributing to the safety of the professional.

OBJECTIVE

To identify preventive measures for pressure injuries caused by the use of personal protective equipment during the COVID-19 pandemic.

METHOD

It is a bibliographic, descriptive, integrative literature review type study.¹⁹ The following steps were delimited for the development of the research: the identification of the theme and selection of the research question; the establishment of criteria for the inclusion and exclusion of studies; the definition of the information to be extracted from the selected studies and the categorization of the studies; the evaluation of the studies included in the integrative review; the interpretation of the results, presentation of the review and the synthesis of the knowledge.²⁰

The preventive measures for pressure injuries caused by the use of personal protective equipment during the COVID-19 pandemic by health professionals were determined as a theme. The objective was to answer the following guiding question: "What are the preventive measures

available in the literature to avoid pressure injuries caused by the use of personal protective equipment during the COVID-19 pandemic?".

The PICO²¹ strategy - with "P" corresponding to the population (health professional); "I" to the intervention (devices/coverages); "C" to the comparison (does not apply, since this is not a comparative study) and "O" corresponding to the outcome (preventive measures) - was used to construct the appropriate question for the resolution of the clinical question researched.

An integrative review of the literature was carried out with the Health Sciences databases, including the Online Medical Literature Search and Analysis System (MEDLINE), Scientific Electronic Library Online (SciELO) and Latin American and Caribbean Literature in Health Sciences (LILACS).

The controlled descriptors in Health Sciences (DeCS) were employed: COVID-19, Pandemics, SARS virus, Pressure ulcer related to medical devices, Equipment and supplies. It is detailed that the search strategy occurred from its different combinations, using the Boolean operator AND in Portuguese and English languages, depending on the researched base.

The following criteria were adopted for the selection of publications that were included in the review: only primary studies that have a direct link with the subject matter; being available in full; original articles and published between 2019 and 2020.

Theses, dissertations, monographs, technical reports and articles which, after the reading of the abstract, are not in line with the proposed object of study are excluded, in addition to publications which are repeated in the databases.

A thorough reading of the titles and abstracts was done independently between two authors to ensure that the texts contemplated the guiding question of the review and met the established inclusion criteria. In case of doubt regarding the selection, it was decided to include the publication initially and to decide on its selection only after the full reading of its content.

The Agency for Healthcare Research and Quality categories were used to classify the level of evidence of the selected studies,²² covering six levels: Level I - evidence resulting from the meta-analysis of multiple controlled and randomized clinical trials; Level II - evidence obtained from individual studies with experimental design; Level III - evidence from quasi-experimental studies; Level IV - evidence from descriptive studies (non-experimental) or qualitative approach; Level V - evidence from case or experience reports; Level VI - evidence based on expert opinions.

It is informed, since this is an integrative review of the literature, that this study did not require the approval of the Research Ethics Committee, however, ethical aspects were considered, such as the citation of the authors of selected articles.

RESULTS

The result was a search in the Health Sciences databases in 203 articles, from which 15 articles were selected for inclusion in the study, according to the illustrative flowchart in the following figure 1.

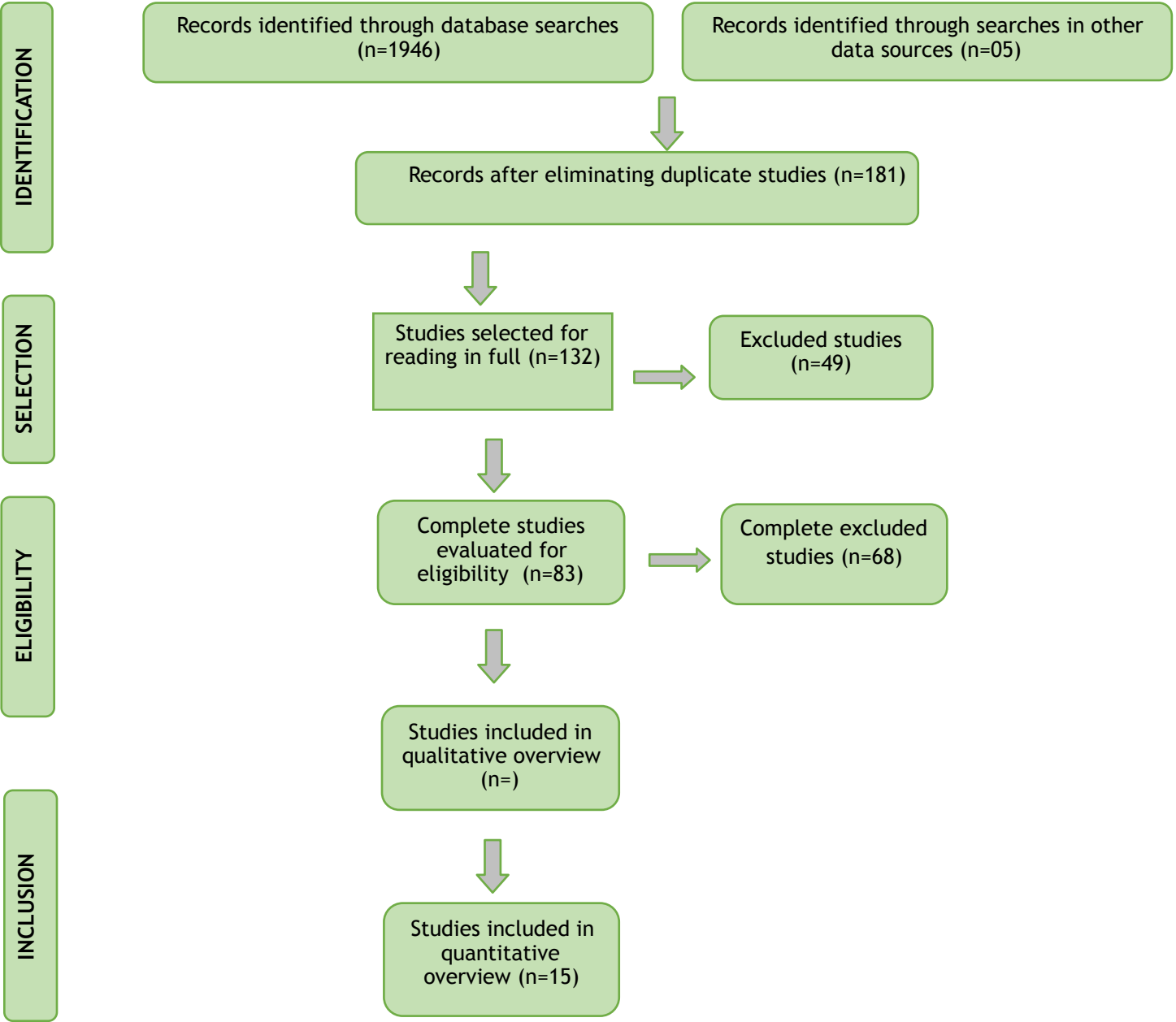


Figure 1. Study selection flowchart adapted from Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2009). São Paulo (SP), Brazil, 2020.

Figure 2 below presents the articles selected during the integrative literature review, 15 of which were classified according to the level in evidence.

Authors	Title	Journal	Level of evidence
Black ²³	<i>COVID-19 and wound care in the US</i>	<i>Wounds Int</i>	6
L a m , M d M y d i n Siddik, Mohd Yussof, Ibrahim ²⁴	<i>N95 respirator associated pressure ulcer amongst COVID-19 health care workers</i>	<i>Int Wound J</i>	4
Jiang, Liu, Wei, Zhu, Chen, Liu, et al. ²⁵	<i>The prevalence, characteristics, and related factors of pressure injury in medical staff wearing personal protective equipment against COVID-19 in China: A multicentre cross-sectional survey</i>	<i>Int Wound J</i>	3
Serra, Ielapi, Barbett, Franciscis. ²⁶	<i>Skin tears and risk factors assessment: a systematic review on evidence-based medicine</i>	<i>Wound J</i>	1
Gefen, Ousey ²⁷	<i>Prevention of skin damage caused by the protective equipment used to mitigate COVID-19</i>	<i>J Wound Care</i>	6

Mills, Savage, Lieder, Chiu ²⁸	<i>Telemedicine and the COVID-19 pandemic: are we ready to go live?</i>	<i>Adv Skin Wound Care</i>	4
Ayello, Sibbald ²⁹	<i>The Importance of Pressure Injury Evidence During COVID-19</i>	<i>J Wound Care</i>	4
Gefen, Ousey ³⁰	<i>Update to device-related pressure ulcers: SECURE prevention. COVID-19, face masks and skin damage</i>	<i>J Wound Care</i>	4
Vera, Alcalde, Carretero, Garcia ³¹	<i>The preventive effect of hydrocolloid dressing to prevent facial pressure and facial marks during use of medical protective equipment in COVID-19 pandemic</i>	<i>Br J Oral Maxillofac Surg</i>	3
Ramalho, Freitas, Nogueira ³²	<i>Medical device-related pressure injury in health care professionals in times of pandemic</i>	<i>Estima Braz J Enterostomal Ther</i>	6
Moore, Pattio, Avsar, McEvoy, Gurley, Budri, et al. ³³	<i>Prevention of pressure ulcers among individuals cared for in the prone position: lessons for the COVID-19 emergency</i>	<i>J Wound Care</i>	4
Galetto, Nascimento, Hermida, Malfussi ¹⁸	<i>Medical Device-Related Pressure Injuries: an integrative literature review</i>	<i>Rev Bras Enferm</i>	1
Oliveira, Lucas, Iquiapaza ³⁴	<i>What has the covid-19 pandemic taught us about adopting preventive measures?</i>	<i>Texto Contexto Enferm</i>	4
Fumarola, Allaway, Callaghan, Collier, Downie, Geraghty, et al. ¹⁶	<i>Overlooked and underestimated: medical adhesive-related skin injuries. Best practice consensus document on prevention</i>	<i>J Wound Care</i>	4
Albuquerque ³⁵	<i>Operational planning during the covid-19 pandemic: comparison between the who recommendations and the brazilian national contingency plan</i>	<i>Cogitare enferm</i>	4

Figure 2. Characteristics of the articles selected through the integrative literature review. Pouso Alegre (MG), Brasil, 2020.

Procedure	Preventive measures
Skin care "before and after the use of PPEs".	Use of the creams and barrier protectors, in particular, which are occlusive and may be a solution because they slow down perspiration and simultaneously reduce the coefficient of friction on the skin due to its greasy nature. (hyperoxygenated fatty acids [HFA])
Use of materials that interface PPEs with the skin in the adhesion/ pressure/friction regions	The interface material should be thin, non-traumatic on removal, absorb moisture, be adaptable to the contour of the face structures, always ensuring the correct sealing of the mask, without causing risk to the user.
	Avoid exaggerated force in the fixing places in order to guarantee optimal sealing, as it will increase the pressure and friction forces in these places, resulting in discomfort and high probability of injury
	Adjust the device to your nose/face shape before definitely applying PPES.
	Confirm that you feel no discomfort at any specific point of contact between the skin and the device.
Skin protection during the use of PPEs	After daily hygiene, apply to the face and regions of greater contact (ears, forehead, nose and malar zone) with the PPEs moisturizing cream and/or skin protector.
	Consider the use of HFA or a cream based on acrylate polymer and/or dimethicone (longer durability).
	It should be applied one hour before the use of PPEs so that the fat of the cream / protector does not interfere with the sealing of the mask, or increase the friction, especially in the nose.
	After washing the hands, the professional should make the proper cleaning of the face and neck.
	Use a saline solution or water and soap to wash the skin, with particular attention to areas that have been under pressure, friction or shearing, remove remnants of fat and peeling that may enhance maceration.
	Dry the face well and then apply moisturizer to the skin (moisturizing cream, hyperoxygenated fatty acids and/or dressing material - the latter, if there is a solution of continuity).

Skin cleansing and moisturizing	Skin care, with daily hydration and protection applications, will reinforce the zones that were at risk and give greater protection for the next shifts, in which the tensions will remain in the places.
	The main skin hydration is not topical, but systemic.
Pressure relief	During each shift of duty, the health professional should relieve the pressure/tension in the respective areas, which should be done in a maximum interval time of four hours.
	If the interface material or PPES is wet or damaged it should be changed immediately.

Figure 3 Measures to prevent injury caused by the use of personal protective equipment. São Paulo (SP), Brazil, 2020.

DISCUSSION

It should be noted that the main contribution of this rapid integrative review is to subsidize the indications in publications in the main journals indexed in the databases, related to the occurrences of pressure injuries associated with medical devices caused by the use of personal protective equipment, considering the sites of development and describing the prevention measures.

It is trusted that such indications are timely as measures to avoid the injuries caused by the use of PPES and for the self-care of those professionals who are on the front line of the COVID-19 pandemic under high risk of contagion. Therefore, preventive measures, such as hand hygiene, skin care before and after the use of PPES and the proper use of PPES, should be reinforced, because such procedures prevent the professional from being infected by the Coronavirus and contracting injury due to the use of PPEs.³⁶⁻⁷

It is informed that, among health professionals, nursing professionals represent approximately 2.2 million in Brazil, which operate in different regions and in non-equitable proportions. These are workers who are at the forefront of patient care and, regardless of the type of care and the health situation, pandemic or not, are at high risk of being contaminated and suffering injuries caused by the use of PPEs.^{36, 3}

It is observed that, according to the daily reports in the media, health professionals who are in the front line of the COVID-19 pandemic have a higher risk of contracting diseases and being affected by injuries caused by the use of PPES. This risk is increased due to the frequent need for intensive care, double work hours, invasive procedures, and exposure to the wide range of disorders that the patient presents; hence the need to observe the precautions standardized by the WHO during the COVID-19, in order to minimize these damages.

The use of PPES (cap, gloves, apron, protective or facial goggles, masks), during the COVID-19 pandemic, should be routine and incorporated into the professional's daily routine. These protective devices are constituted in basic materials, necessary and indispensable to avoid the

spread of infection in the hospital environment, as well as to protect the professional from injuries, being necessary that these professionals are properly guided and trained.⁷⁻⁹

It is recommended that the use of Personal Protective Equipment be adopted by all health professionals involved in the care of patients in health institutions, regardless of the pathology, initially suspected or diagnosed, and that the institutions provide training and permanent education directed to the technique of the use of PPEs and preventive measures for injuries.

According to the Ministry of Labor and Employment, in Regulatory Standard 6 (NR 6) of Ordinance 3.214/78, every device or product of individual use used by the worker and destined to the protection of risks susceptible to threaten the safety and health at work is considered a PPES.¹⁰

Several studies have reported that the standardization and training regarding the use and handling of PPEs and the preventive measures related to the risk of injuries and skin care, before and after the use of PPEs, are essential for professionals to have the necessary subsidies to promote safety in the work environment and prevent contamination and injury.^{21-2,38}

It was concluded in other researches developed with the objective of evaluating the impacts of the use of PPEs, that the professional has a great potential of risk to suffer injuries and, by implementing protocols of the correct techniques of the use of PPEs and preventive measures, the injuries caused by the use of protective equipment are considerably reduced.^{25,27,32-3,37-38}

Recently published studies have suggested several measures to maintain the integrity of the professional's skin during the use of PPEs in the COVID-19 pandemic: sanitize the skin; moisturize the skin before and after the use of PPEs; apply prophylactic coatings/devices (thin polyurethane foam, silicone, transparent film or extra thin hydrocolloid plates) as an interface between the skin and the mask fixation area or protective glasses.^{15,25,32}

It is argued that the health professional who is in the front line needs to prioritize the maintenance of his health and skin integrity through the correct use of good quality PPEs, and it is important that hospital institutions promote training in this sense. It is essential, for safety measures to be successful, the institutional support, as well as the participation, involvement and recognition by professionals of the risks coming from their practice.

CONCLUSION

It is recalled that during the integrative review of the literature, no clinical, control, randomized and double blind studies were identified, however, several publications related to case studies and experience reports were found that demonstrate the effectiveness of the use of covers or devices and skin care before and after the installation of PPEs to prevent pressure damage caused by the use of protective equipment.

Health professionals, who are working in the pandemic, taking care of patients with COVID-19, run the risk of being affected by pressure lesions caused by the use of PPEs. It is suggested that everyone uses the covers/device to protect the skin and perform the cleaning and hydration of the skin before and after the removal of PPEs. It is recommended that these professionals consider these actions as effective strategies in the prevention of injuries.

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