

## The Importance of Academic Medical Education in Pressure Ulcer Prevention, Treatment and Management

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### Abstract

Despite recent advances in health care, pressure ulcer-PrU still constitutes an important cause of morbidity and mortality and leads to relevant socioeconomic issues. The treatment of PrU is expensive and highly complex, so prevention plays a fundamental role in minimizing the occurrence and consequences of this disorder. To prevent and treat PrU effectively, health teams have to implement successful team work. Currently, prophylactic practices and the treatment of PrU are often delegated exclusively to health professionals other than physicians. It may culminate in higher prevalence of chronic PrUs and low solving of cases that require surgical procedures to promote wound healing more quickly, avoiding more serious complications. Few studies have been published raising the issue of the need to promote educational programs for physicians, especially in academic training for PrUs management. This article presents a narrative review of the literature on this problem and highlights the importance of this topic in academic medical education programs. Improved clinical practice demands educational measures that reinforce the need to have professionals with knowledge of PrU including graduation of medical schools. These measures should foster collaboration among health professionals and contribute to implementation of preventive actions and continuous treatment of more complex PrU.

**Keywords:** Students; Medical; Interdisciplinary Studies; Pressure; Ulcer

### Introduction

Pressure ulcers-PrUs constitute an important cause of morbidity and mortality among bedridden patients with severe illnesses or restricted movement [1,2].

This condition significantly impacts the quality of life of individuals and their relatives [3]. PrU results from ischemia due to extrinsic and prolonged compression of tissues between an underlying bone protrusion and a support structure such as a bed or a wheelchair. PrUs of the sacral, ischial, and trochanteric region are the most frequent sores [4]. Several classification systems for staging of a PrU have been developed. The most widely accepted system was introduced by the NPUAP Consensus Development Conference in 1989 and updated in 2007. The NPUAP system offers guidelines that are easy for the examining professional to follow. Besides external signs of tissue lesion, like erythema and vesicles, this system incorporates signs and evidence of internal skin rupture [5].

### Stages of PrU

Stage 1 PrU is characterized by intact skin with non-blanchable erythema; the ulcer usually localizes over a bony prominence. Blanching in dark skin may not be visible, but its color may differ from the color of the surrounding skin. Compared with the adjacent tissue, the affected area may be painful (except in cases of sensitivity loss), hardened or softened, and cooler or warmer. Stage II PrU includes partial thickness loss of the dermis. The lesion presents as a shallow or

superficial ulcer with a red base. It may also emerge as a ruptured or intact blister. The ulcer arises as a shiny or dry wound, without slough or bruising. Stage III PrU corresponds to total skin thickness loss. Subcutaneous fat may be visible, but bones, tendons, and muscles remain unexposed. It may include undermining or tunneling. Stage IV PrU refers to total tissue thickness loss with exposure of bones, tendons, or muscles. It may occur in devitalized or necrotic tissues and is often undermined and tunneled. The more the ulcer deepens, it can favor complications as osteitis, osteomyelitis, Septic arthritis and sepsis [4-7].

### The multidisciplinary approach for PrU

The health team must focus on identifying patients susceptible to PrU and conducting systematic prevention [8].

In order to achieve effective prevention and treatment, it is necessary to implement team work within the multi-professional team and to adopt a comprehensive and integrated approach to the various aspects of PrU. The international medical literature refers extensively to evaluation and discussion of the nursing staff knowledge about PrU management. However, few studies have assessed physicians' knowledge of the management of this condition [1,9,10].

For more complex cases such as patients with ulcers stages III and IV, doctors should lead the treatment team that often requires reconstructive surgery [11]. Thus, the academic training in medical schools covering the subject of PrUs seems to be relevant. In this scenario, it is essential to discuss the importance of PrU in medical education programs and to rethink the role that physicians play in multi-professional teams working with PrU management [12]. As a multi-professional team member, physicians will surely face a situation

when their work and knowledge are crucial to the overall management of this complex health condition.

## Objectives

This study aimed to conduct a literature review focusing in the importance of academic medical education programs with respect to PrU prevention and treatment.

## Method

The present study was based on a narrative review by following the PubMed-NCBI and Up-to-date database search criteria. The inclusion criteria were as follows: articles in English, Spanish, or Portuguese about PrU and its treatment and prevention correlated with medical practice and the importance of academic education about the topic. In English, the search words were pressure sore, pressure ulcer, prevention, multidisciplinary, graduation, and medical. In Portuguese, the search words were "úlceras por pressão, prevenção, multidisciplinar, graduação, médico". In Spanish, these terms were "úlceras por presión, prevención, multidisciplinario, graduado, y médico".

Our initial search retrieved 5188 results for the keywords "pressure ulcer" and "prevention". Because most of the retrieved articles were not directly correlated with our proposal, the terms "education" and "medical graduation" were added in English, "educación; graduación médica" in Spanish, and "educação; graduação médica" in Portuguese. After filtering for undergraduate medical education about PrU, 36 articles were selected. Among these articles, six were excluded for at least one of the following reasons: personal reports that did not provide relevant scientific evidence, non-completed studies, and/or articles that were part of technical guidebooks containing chapters on the topic of PrU. Therefore, this review covered 30 articles. All the articles that were not written in English, Spanish, or Portuguese were excluded.

## Results

Our search revealed that the nursing staff prevailed as the main caregiver and holder of knowledge about PrU. In fact, nurses authored many of the articles evaluated in this review and described their expertise in PrU prevention and treatment [3,13-21]. Of the 30 selected articles, only five suggested more relevant experience concerning the topic of academic education geared toward PrU [1,9,10,12,13].

Jones et al. [13] described an experience of an acute district general hospital. They highlighted deficiencies in the knowledge base of the staff and in the care given to prevent and manage pressure ulceration. They identified educational and service needs and developed a specifically designed education program in the area of PrU with relevant involvement of nurses. A questionnaire was administered before and after a course on PrU to comparatively evaluate the theoretical knowledge of professionals. The success of the program was demonstrated by an increase in knowledge about the subject of nurses in prevention and management of PrUs. Meaume et al. [10] present the results of a survey conducted in France at the end of a theoretical and practical training program in wound healing, including PrU, for nurses, physicians, pharmacists, physiotherapists and employees of commercial concerns. Their results show that education and training provided undertaking a university diploma has played an important

role in the development of wound healing and the subsequent change in practice in France.

However, we found only three studies about educational programs specifically for physicians, especially in academic training for PrUs management. Odierna et al. [12] conducted a survey to assess the educational experiences of geriatric fellows on the subject of PrUs. They found that geriatric fellows need to improve their knowledge and confidence with regard to pressure ulcer care to become competent as clinicians and educators for this condition. They suggested that a specific curricular guidelines and a validated knowledge assessment instrument on pressure ulcers are needed to improve the educational effectiveness of a geriatrics fellowship.

Other two studies point to the need for greater involvement and education of physicians in relation to the subject of PrUs. Levine et al. [9] studied comparatively the knowledge of doctors and nurses on PrU. The inferior results achieved by physicians in the evaluation scores suggest a need to include content on PrU in medical education. Similarly, Cox et al. [1] reported a survey with 56 critical care physicians to determine critical care physicians' attitudes, beliefs, and knowledge toward pressure ulcer (PrU) prevention and treatment in critical care patients. The majority of physicians (69%) reported poor to adequate basic medical education training on PrU prevention and treatment. They concluded that as part of the treatment team of critically ill patients, these professionals can benefit from educational training programs on the subject [1].

## Discussion

The increase in longevity and disability, along with the increasing number of spinal cord injury events among the world population has progressively demanded specialized staff with expertise in integrated treatment and prevention of complex wounds, such as PrUs. Estimates have indicated that between one and three million people develop PrU in the USA each year. The US Joint Commission on Patient Safety estimates that 2.5 million patients under intensive care have PrU, and that approximately 60,000 of these patients die of complications every year. According to US estimates, the prevalence of PrU among individuals undergoing prolonged hospital care or receiving in-home care lies between 2.3 and 28% and between 0 and 29%, respectively [4]. Hospital mortality rates among these more critical patients may reach values between 59.5 and 75%, which shows the enormous challenge that patients and health professionals have to face along PrU treatment [22,23].

These patients often have their general condition affected by malnutrition and local and systemic infections that can culminate in death [4,24]. Guihan and Bombardier [25] conducted a survey among 148 veterans with spinal cord injury hospitalized for severe pressure ulcers. Most of the study ulcers were stage IV (73%). Diverse comorbid conditions were detected, including respiratory disease (66%), gastrointestinal (51.2%), and autonomic dysreflexia (47%), whereas others had conditions believed to increase PrU risk including renal disease or urinary tract infection (50%), diabetes (33%), and constant moisture (19%).

The first stages of PrU affect more superficial layers of the skin, but if the ulcer deepens, it may involve muscles or other supporting structures, favouring osteitis, osteomyelitis, Septic arthritis and sepsis [4,5,7].

These data reinforces the importance of adequate and widespread training of health teams for the prevention and treatment of PrUs. In this context, a question arises: Does PrUs are currently being conducted by an effective integrated health team?

Traditionally, the prevention and management of PrUs has been delegated to the nursing staff [1,15-17]. However, it is quite reasonable to believe that the development of pressure sores can not always be attributed to lack of nursing care, but also depends on the severity and the patient's collaboration, along with the failure of cooperation and competence of all personnel health (medical and non-medical) [26]. Jankowski and Nadzam [21] evaluate the results after one year of implementation of preventive measures for PRU in four hospitals. Among the results, they noticed common gaps in terms of limitations in staff education and training and lack of physician involvement.

Nevertheless, very little is known about the level of physicians' knowledge in relation to prevention and treatment of PrUs. More recently, some studies have identified the growing and need for implementation of programs offering more awareness about prevention and treatment of PrUs, specifically with greater involvement of physicians, especially in academic training for PrUs management [1,9,12]. Although the current prevention models and guidelines for PrU treatment have been developed for all health professionals to use, prophylactic practices and treatment are traditionally delegated to professionals other than physicians [27]. However, PrUr with advanced degree of tissue involvement, such as stage III and stage IV, not rarely complicated with infection and require surgical treatment [11,23,27,28]. Sharp removal of necrotic tissue, beyond reduce source of infection and sepsis, is essential for wound healing [11,24]. Negative pressure therapy-NPT also can be associated to prepare the bed wound for reconstructive surgeries [29]. It is also important to cover the defects with a thick flap to give more support and protection to the areas which undergo pressure [4]. Obviously, those more interventionist conducts are outside the scope of non-medical professionals.

The growing demand for wound care by patients with complex wounds has called for structuring of a multi-professional assistance team that can conduct wide-ranging interdisciplinary discussions on the topic of PrU treatment [11,23]. Literature reviews have pointed out that successful PrU management depends on an integrated and multi-professional approach to this theme, which should not be almost exclusive to the nursing staff [1,15,16,23]. In this regard, we emphasize in the present article the importance of developing educational programs since graduation from medical school for more extensive training on the prevention and treatment of PrUs in an integrated manner to other medical professionals.

This review found that there is a significant lack of studies about the importance of academic medical education in PrU prevention, treatment, and management. Odierna et al. [12] found that geriatric fellows need to improve their knowledge and confidence with regard to pressure ulcer care to become competent as clinicians and educators for this condition. They point a need of a specific curricular guidelines and a validated knowledge assessment instrument on pressure ulcers to improve the educational effectiveness of a geriatrics fellowship.

Levine et al. [9] argue that with an aging population and the increasing prevalence of pressure ulcers, doctors are more concerned about the PrUs. Also, they raise the idea that physicians' knowledge regarding PrUs has not been sufficient and it takes on new urgency. They warn of the fact that pressure ulcer content, including prevention,

identification, staging, and treatment, needs to be included in physician education. In the same direction, Cox et al. [1] reported a survey with 56 critical care physicians. They emphasized that the majority of physicians reported poor to adequate basic medical education training on PrU prevention and treatment. They concluded that critical care physician, as a vital member of this team, may benefit from PrU education in an effort to heighten awareness about this phenomenon in critical care patients.

We are postulating that this lack of studies found about programs of medical education on the subject of PrUs may be consequent of the current routine observed by researches that doctors are delegating the care of patients with PrUs almost exclusively to the non-physician staff [1,9,21]. Physicians now seem to be concerned about their lack of involvement with the theme of PrUs, pointing to a new urgent search for educational programs for the prevention and treatment of PRUs. It is important to emphasize that PrU is not a separate entity that requires local treatment only, but a part of the entire body that requires systemic treatment [30].

Given the relevance of the theme of the PrU to the wound centers, we highlight the importance of a major integration of physicians as a crucial team member. Moreover, we stress the need to development of studies about educational programs on graduation from medical school for more extensive training on the prevention and treatment of PrUs.

## Conclusion

Despite recent advances in health care, PrU still constitutes an important cause of morbidity and mortality and leads to relevant socioeconomic issues. Usually, prophylactic practices and the treatment of PrU are delegated almost exclusively to health professionals other than physicians. It may culminate in low solving of cases that require surgical procedures to promote wound healing more quickly avoiding more serious complications. Additionally, there is lack of studies showing programs of medical education on the subject of PrUs. In this sense, it highlights the importance of further studies to discuss the curriculum of medical students on prevention, treatment and pressure ulcer management.

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