NURSES' KNOWLEDGE ON USE OF COLAGENASE IN PRESSURE ULCERS CONHECIMENTO DE ENFERMEIROS SOBRE O USO DA COLAGENASE EM LESÕES POR PRESSÃO

CONOCIMIENTO DE ENFERMEROS SOBRE EL USO DE LA COLAGENASIS EN LESIONES POR PRESIÓN

Thalys Maynard Costa Ferreira¹, Carla Lidianie Jácome de Lima², Josefa Danielma Lopes Ferreira³, Patrícia Simplicio de Oliveira⁴, Glenda Agra⁵, Ianne Mayara Costa Ferreira⁶, Wellyson Souza do Nascimento⁷, Marta Miriam Lopes Costa⁸

ABSTRACT

Objective: to verify the nurses' knowledge about the use of collagenase in pressure injuries. **Method:** qualitative, exploratory, descriptive study performed in two hospital institutions with 20 nurses working in medical clinics. Data were collected through semi-structured interviews and analyzed by the Content Analysis technique in the Thematic Categorical modality. **Results:** the nurses' knowledge about collagenase in the treatment of pressure injuries was satisfactory; however, improvements pertinent to the inherent peculiarities of the evaluation criteria of the injuries and the use of the enzymatic substance are evidently necessary to achieve a more skilled assistance. **Conclusion:** technical and scientific knowledge is of paramount importance as it favors the elaboration of treatment and care strategies for the evolution of pressure injuries, including the use of the enzyme under study. **Descriptors:** Nursing; Pressure ulcer; Knowledge; Treatment.

RESUMO

Objetivo: verificar o conhecimento de enfermeiros sobre a utilização da colagenase em lesões por pressão. **Método:** estudo qualitativo, exploratório, descritivo, realizado em duas instituições hospitalares com 20 enfermeiros atuantes nos setores de clínica médica. Os dados foram coletados por intermédio de entrevista semiestruturada e analisados pela técnica de Análise de Conteúdo na modalidade Análise Categorical Temática. **Resultados:** o conhecimento dos enfermeiros acerca da colagenase no tratamento das lesões por pressão demonstrou-se satisfatório, no entanto melhorias pertinentes às peculiaridades inerentes aos critérios avaliativos da lesão e do uso da substância enzimática são evidentes e necessárias para que o alcance de uma assistência exímia seja concretizado. **Conclusão:** o conhecimento técnico e científico torna-se de suma importância, pois favorece a elaboração das estratégias de tratamento e cuidado destinadas à evolução das lesões por pressão, incluindo o uso do enzimático em estudo. **Descritores:** Enfermagem; Úlcera por Pressão; Conhecimento; Tratamento.

RESUMEN

Objetivo: verificar el conocimiento de enfermeros sobre la utilización de la colagenasis en lesiones por presión. **Método:** estudio cualitativo, exploratorio, descriptivo, realizado en dos instituciones hospitalares con 20 enfermeros actuantes en los sectores de clínica médica. Los datos fueron recogidos por intermedio de entrevista semi-estructurada y analizados por la técnica de Análisis de Contenido en la modalidad Análisis Categorical Temático. **Resultados:** el conocimiento de los enfermeros acerca de la colagenasis en el tratamiento de las lesiones por presión se demostró satisfactorio, sin embargo mejorias pertinentes a las peculiaridades inherentes a los criterios evaluativos de la lesión y del uso de la sustancia enzimática son evidentes y necesarias para que el alcance de una asistencia exímia sea concretizada. **Conclusión:** el conocimiento técnico y científico se torna de suma importancia, pues favorece la elaboración de las estrategias de tratamiento y cuidado destinados a la evolución de las lesiones por presión, incluyendo el uso del enzimático en estudio. **Descriptores:** Enfermería; Úlcera por presión; Conocimiento; Tratamiento.

¹Master student, Graduate Program in Nursing, Federal University of Paraíba/PPGENF/UFPB. João Pessoa (PB), Brazil. E-mail: thalys_maynard@hotmail.com ORCID iD: <http://orcid.org/0000-0001-8758-6937>; ²Master in Nursing (egress), Graduate Program in Nursing, Federal University of Paraíba/PPGENF/UFPB. João Pessoa (PB), Brazil. E-mail: carlalista2006@yahoo.com.br ORCID iD: <http://orcid.org/0000-0002-5101-4408>; ³Master, Maurício de Nassau Faculty - João Pessoa Unit (PB). João Pessoa (PB), Brazil. E-mail: danielma.jp@hotmail.com ORCID iD: <http://orcid.org/0000-0003-4209-4781>; ^{4,5}PhD students, Graduate Program in Nursing, Federal University of Paraíba/PPGENF/UFPB. João Pessoa (PB), Brazil. E-mail: p_simplicio@hotmail.com ORCID iD: <http://orcid.org/0000-0002-9964-4564>; E-mail: g.agra@yahoo.com.br; ORCID iD: <http://orcid.org/0000-0002-7628-9029>; ⁶Student, Nursing Course, University Center of João Pessoa /UNIPÊ. João Pessoa (PB), Brazil. E-mail: iannebarros26@hotmail.com ORCID iD: <http://orcid.org/0000-0002-6824-8833>; ⁷Student, Nursing Course, Nova Esperança Nursing Faculty /FACENE. João Pessoa (PB), Brazil. E-mail: wellysonrep@hotmail.com ORCID iD: <http://orcid.org/0000-0002-3977-2556>; ⁸PhD, Graduate Program in Nursing, Federal University of Paraíba/PPGENF/UFPB. João Pessoa (PB), Brazil. E-mail: marthamiryam@hotmail.com; ORCID iD: <http://orcid.org/0000-0003-4454-9348>

INTRODUCTION

The incidence of wounds is a health problem that involves several factors related to both the patients and the external environment, including the physical structure, resources, supplies, and multiprofessional team available to assist patients in the hospital. In this scenario, it is observed that in most cases it is up to nurses to develop and adopt routines of care and prevention in the management of wounds, seeking to know the risk factors, treatments and prevention.¹⁻²

Wounds consist of lesions of a dermatological nature that compromise skin integrity to a greater or lesser extent and with diverse etiology, such as physical, mechanical or chemical traumas, or even a change in health state triggered by a clinical condition.³

Currently, skin lesions that most affect hospitalized patients are known as pressure injuries (PIs). They are chronic and considered a public health problem because of their high incidence, cost and recurrence rates.⁴ Previously defined as pressure ulcers, pressure injuries consist in a localized damage to the underlying skin and/or soft tissues, usually on a bone prominence or related to the use of medical devices or other artifacts. It occurs as a result of intense and/or prolonged pressure in combination with shear.⁵

With regard to the treatment of wounds, this is based on a multidisciplinary activity but the nursing team is given the power of decision in the conducts, as well as a vast means of dissemination of knowledge, according to Resolution 501/2015 of the Federal Nursing Council (COFEN). Such Resolution regulates the competencies of the nursing team aiming at effective care and patient safety, including the performance of dressings, coordination and supervision of the team for wound prevention and care.⁶⁻⁷ It should be noted that the success of the treatment depends, among other factors, on judicious choice, as well as on the appropriate use of selected products.⁶

Thus, several are the options of products and dressings that professionals can select to treat wounds. Among them is collagenase, an enzymatic covering that has native and denatured collagen as substrate. It is commercially available in form of ointment or cream and has the function of removing cellular debris from necrotic tissue, thus performing chemical debridement and indirectly stimulating the formation of granulation tissue and re-epithelialization.⁶

Collagenase is one of the most widely used substances for the treatment of wounds,

including PI, and is routinely used by professionals seeking improvement of the injury, but often inadequately, without the possible scientific ground for its clinical application, and this situation can delay the cicatrization.⁴⁻⁸

It is imperative to demonstrate that aggravating factors contributing for patients developing PIs can be previously detected by the nursing team, thus avoiding the prolongation of the stay of patients in the hospital environment, as well as reducing the risk for the appearance or appearance of complications of these wounds through alternative means.¹

It is important to know the products available and make proper use of them, since there is a range of coverings and topical agents that can be used, and it is up to nurses to critically analyze the cost/benefit of their actions aiming at successful treatment and at adequate therapies. This can foster the need for the participation of the nursing team in the decision-making process, always aiming at the healing of the injury.⁹

The development of this research is justified by the opportunity to reflect on the nurses' knowledge about the use of collagenase in the treatment of patients with PI.

OBJECTIVE

- To verify the nurses' knowledge about use of collagenase in pressure injuries.

METHOD

This is a qualitative, exploratory study developed in the medical clinic units of two hospital institutions in João Pessoa/PB in December 2015. The selected hospitals were named Hospital A and Hospital B to keep them anonym. These hospitals were chosen because they develop integral care for people with chronic lesions (elderly and adults), regardless of etiology, as well as for using Collagenase routinely in dressings.

The sample consisted of 20 nurses who met the following inclusion criteria: being present at the Medical Clinic Units at the moment of data collection; working with nursing interventions linked to PI treatment. Nurses who were not working at the time of data collection and who did not undergo PI treatment were excluded.

A semi-structured script was used for data collection including questions related to the characterization of the sample and subjective questions related to the object of the study. The questionnaire was applied in the form of

an interview with the professionals working in the unit. The participants were identified by a sequential alphanumeric code, using the letters NUR (of nurse) followed by the Arabic numeral of the sequence of interviews (e.g.: NUR1, NUR2, NUR3). This initiative aimed to ensure the secrecy and anonymity of the testimonies. Interviews were recorded with the help of a Smartphone and transcribed verbatim, opting for transcription post-collection of data, so that the reliability of data could be preserved. The interviews were conducted in a reserved place, and at a suitable time that did not interfere with the work routine of the participants.

Data were analyzed through the technique of Content Analysis proposed by Laurence Bardin, which consists of a thematic categorization of the content inserted in the discourse of the interviewees through systematic techniques. The methodology was accomplished through the fulfillment of the Content Analysis phases, namely: pre-analysis of the collected data, material exploitation, and treatment of results.¹⁰

To carry out the research, the provisions of Resolution nº. 466/12 of the National Health Council on research involving human beings in force in the country were taken into account. The COFEN Resolution nº. 311/2007 which provides for the code of ethics of nursing professionals was also observed.¹¹⁻¹² The project was approved by Research Ethics Committee of the Health Sciences Center of the Federal University of Paraíba, according to CAAE 17913813.9.0000.5188.

RESULTS AND DISCUSSION

Twenty nurses working in Medical Clinics were interviewed, of which 14 belonged to Hospital A and six to Hospital B. Eighteen participants (90%) were female and 10 (50%) were aged between 31 and 45 years.

Regarding time elapsed after completing professional training, 12 (60%) nurses had more than ten years; 12 (60%) had been working with PI care for more than five years; 16 (80%) had post-graduation *lato sensu*, and only one nurse was specialist in stomatherapy.

Regarding nurses' knowledge about the use of collagenase in the treatment of PI, the following categories emerged from the contents of the discourses: 1) Knowledge about pressure injuries; 2) Clinical criteria for evaluation of pressure injuries; 3) Knowledge about the use of collagenase in the treatment of pressure injuries; 4) Expansion and improvement of knowledge in wound treatment.

◆ Knowledge about pressure injuries

This category addresses the nurses' knowledge on pressure injuries, revealing the way these professionals define them considering the pathophysiological aspects of their occurrence and revealed also the lack of preventive measures used in professional practice, as reported below:

It is an injury caused by a greater pressure in a bone prominence, or even by the complication of pre-existing injuries due to a deficit in tissue oxygenation, because of erroneous handling or lack of care. (NUR.3)

It is an injury that results from inadequate pressure on a certain point that is fragile, already susceptible to the occurrence of this lesion. (NUR.2)

It is defined as a lack of care, that is, lack of decubitus change that leads to a pressure ulcer. It is also for lack of hydration, lack of adequate mattress, and moisture in sites of bone prominence. (NUR.4)

It is precisely because of the great deficit of professionals that it does not allow us to perform decubitus change every two hours, let alone the other preventive practices and, besides that, we have the issue of the patients' diagnosis, and their various weaknesses that contribute for the development of the lesion. (NUR.7)

Based on the context explored in the interviewees' speeches and the literature, these professionals attribute mainly to pressure the causes of PI. This is consistent with the literature which, in addition to pressure, also points to factors such as shear, moisture and nutritional deficits as causes for these injuries.¹³

These factors lead to a gradual disruption of epithelial tissue layers, causing necrosis in the respective sites due to the obliteration of blood flow and consequent oxygen and nutrient deficit. The chronic wound that develops is called pressure injury and can reach vital tissues and organs, bringing complications at a systemic level, thus further aggravating the patient's clinical condition.¹³

Another aspect pointed out by nurses as the cause of development of PIs was the lack of preventive measures performed by the nursing staff itself. This agrees with the literature; care with skin integrity, such as prevention of PIs is listed among the components of the nursing practice. Such care begins with the identification of patients at risk for PI and implementation of elements to prevent it.¹⁴

As preventive measures, five actions were mentioned: risk assessment with a valid instrument; decubitus change; management of aspects related to nutrition, moisture and

incontinence; use of surfaces to aid adequate pressure distribution; and ongoing education of nursing professionals on PI prevention.¹⁵

◆ Clinical criteria for evaluation of pressure injuries

In this category, the professionals explained their conceptions about the assessment of pressure ulcer staging as something exclusively performed based on the use of isolated clinical signs and measurable characters, showing a slight lack of concision regarding the evaluative categorization and distinction of signs according to the respective degrees of evolution considering tissue loss, as well as other pathophysiological aspects.

As soon as we open the dressing, we check if it has exudate, and so we continue evaluating. We observe depth, border size, whether fibrin is present, whether systemic antibiotics are necessary, if there is necrosis, and involvement of deeper tissues. (NUR.12)

We see the borders, if there is an odor (infection), if there is fibrin, if the patient has had these signs for a long time, if he has necrosis, if he has redness, since the onset of the lesion is established, and then we proceed with the evaluation. (NUR.5)

I do not use any scale, but we observe the depth and extent of the wound and evaluate the state of tissue commitment. (NUR.1)

If pressure injuries are left untreated, they can reach an advanced stage of progression, severely affecting tissues in the area and gaining depth as they progress. Nursing diagnoses ensure early interventions to prevent the development of these injuries, and can thus determine the best course of action to be taken in view of the clinical picture evaluated.¹⁶

In April 2016, the National Pressure Ulcer Advisory Panel (NPUAP), besides changing the terminology of Pressure Ulcer to Pressure Injury, also updated the nomenclature of staging classification: Arabic numerals replaced Roman numerals; the term "suspicion" is no longer part of the category of Deep Tissue Injury; and two further PI definitions were created: Pressure Injury related to Medical Device and Mucosal Membrane Pressure Injury.⁵

Pressure injury stages are classified according to the characteristics of the wound such as destruction of visible tissues, which can be checked by nurses in their evaluations. PI staging consists in the following categories: *stage 1*, characterized by the presence of a hyperemic region caused by pressure exerted on the skin, usually in a bony prominence; *Stage 2*, characterized by the presence of involvement of the superficial layer of the

skin, the dermis, and possible formation of blisters containing serous fluid, which may be intact or ruptured⁵; *Stage 3*, characterized by total loss of epithelial tissue, epidermis and dermis, leaving adipose tissue visible and presenting scrap tissue in some cases; *Stage 4*, which can be considered the most serious stage because there is a total loss of tissue, exposing bones, muscles and tendons.⁵

Pressure injuries may also be defined as unstageable - when the extent of skin loss cannot be measured due to the masking effect of dark crumble or eschars - and Deep Tissue Pressure Injury - when there is a persistent and non-blanchable deep red, maroon or purple discoloration resulting from intense pressure combined or not with shear between bone and muscle.⁵

The NPUAP update also defines PI according to the etiology of the injury: Medical Device-related Pressure Injury, a consequence of the use of devices for diagnostic and therapeutic purposes; and Mucosal Membrane Pressure Injury, resulting from the use of medical devices on the damaged site.⁵

The characteristics of the injury are considered an essential parameter for its diagnosis, especially if the wound is in a more advanced stage, or even if mixed tissue (granulation, fibrin, necrotic tissue) is present in the bed. With this, the professionals can obtain information about tissue characteristics and the necessary care to choose the most appropriate treatment. Nurses must necessarily have knowledge regarding classification of PI, as well as knowledge about their clinical aspects, because only through this framework of clinical behaviors the evaluation can be effective and performed in a resolute way.¹

◆ Knowledge about the use of collagenase in the treatment of pressure injuries

In this category, the interviewed professionals were able to discuss their knowledge about collagenase as a form of treatment for PI through their discourses, which went through the concept of the substance, the particularities of the drug and the use of the ointment, based on criteria supported by scientific knowledge.

A small part of nurses presented a definition of collagenase that agrees with the concept found in the literature, while others said that collagenase is an autolytic debriding agent, showing that they were far from the real concept of the substance.

Collagenase is an ointment that we use to remove necrotic, non-viable tissues, for the

progress of the wound healing process. It is a very useful enzymatic debriding agent. It has a quick action, and that's why nurses here like this ointment. (NUR. 6)

I consider it as an autolytic debriding substance used for removal of dead tissues, of course, when we cannot remove it through the use of the ointment, we have to do the mechanic procedure, but it is very good to remove necrosis. (NUR. 12)

It is a drug for autolytic debridement that is given in the form of an ointment; it helps in the removal of coagulation necrosis very effectively. I use it very often in pressure injuries when there is obvious necrotic tissue. (NUR. 17)

[...] in coagulation necrosis, it is an ointment that we can use with confidence, because as it is a substance for autolytic debridement, it helps in the removal of this tissue through the destruction of collagen. (NUR. 15)

There are different ways of cleaning a wound when devitalized tissues are present and need to be removed to allow a better evolution of the lesion. When it comes to the technique of debridement, there are some methods that contribute to the progression of wound healing, including mechanical or surgical debridement, which consists of a practice of removing necrotic tissue by means of manual techniques using instruments such as scalpel blades and curettes.¹⁷

Furthermore, there are two other modes of debridement. The first is the *autolytic* mode, which consists of a type of debridement performed by a selective process of removal of necrosis through the action of the body's own digestive cells and enzymes, being primarily developed from components that keep the wound bed moist, thus facilitating the access of cells that promote healing in the region. The second mode is the *enzymatic* or *chemical*, which consists of using degrading substances, such as enzymes that dissolve necrotic tissue, facilitating the cicatrization process after the removal of the enzymatic substance.

Collagenase, in turn, is classified as an enzymatic or chemical debriding drug, since it has specific enzymes that degrade collagen fiber, thus cleaning the injury through removal or even dissolution of the devitalized and crusted tissues.¹⁷

As for knowledge of the process of debridement, the discourses showed that the professionals attribute the removal of necrotic tissue from the PI as the main action of collagenase, making treatment consequent healing of the lesion possible.

Because it is an enzyme that acts in the coagulation necrosis, it removes all the tissue through collagen break, and in this

way, it enables the work of the professional. (NUR. 8)

It will remove precisely the macerated, devitalized, necrotic tissue to promote a possible healing and the improvement of the lesion, especially of the wound bed. It makes wound evaluation possible. (NUR. 10)
In this case, it acts by removing and making that lesion viable so that all that part of devitalized, necrotic tissue may deteriorate later, and then, we can start other therapeutic practices. (NUR. 11)

The role of collagenase, and its properties as a covering, is to act as an agent that promotes healing of the lesion by removing necrotic tissue, helping the professional to ensure a good evolution of the wound. (NUR. 13)

It will act as a facilitator because it acts faster than the hydrocolloid gel at certain stages of necrosis. Because, it's like, moisture in the lesion is better promoted by hydrogels, collagenase does not provide adequate moisture among its main effect, but it helps to debride. To promote moisture, I use hydrogels, but to help in debridement, I use collagenase. (NUR. 16)

Collagenase is a preparation obtained from a bacterium called *Clostridium histolyticum*, which has as its main component the enzyme called Clostridiopeptidase A in addition to other important proteases that contribute to the lytic action. The substance in question has the function of degrading the collagen in its natural or denatured structure. This action facilitates the removal of necrotic tissue, for this is fixed in the surface of the injury by collagen filaments. Thus, after digestion of these fibers, the tissue can easily be removed.^{9,18}

The enzyme acts by breaking the apolar region of the structure of the collagen fiber formed by amino acid sequences. Thus, after cleavage of the apolar region, peptides with higher molecular weight are formed due to fiber lysis, which will be more easily digested by collagen-specific peptidases and also by non-specific proteases.^{9,19}

With respect to the kinetics of the substance, collagenase acts after eight to 12 hours of its application, with the possibility of continuing its action for a period of 24 hours. Notably, collagenase does not appear to be well absorbed in regions with marked necrosis, and is inactivated and digested in the own area of application. So, it is necessary that nurses remove the bedsore before application of collagenase in the case of extensive necrotic areas, for this could lead to an improved effect of the substance and consequent access to sub-tissue fibers found in necrosis.¹⁹

Nurses are professionals who are able to make the choice of this substance for use in pressure injuries, as well as to perform the diagnostic assessment of the wounds. However, they are not the only ones who perform such actions. The participation of other professionals is clearly necessary.²⁰

Collagenase provides great security regarding the decision and therapeutic conduct of professionals. Understanding and mastering aspects related to the substance consistency, need for replacement of collagenase by another type of covering, promotion of moisture in the wound bed associated with drug use, length of stay of the covering and need for exchange when using ointment, contraindications, posology criteria, and possible adverse reactions are aspects that should be taken into consideration by nurses when they opt for collagenase as a curative mode to promote the healing of the lesion.^{18,21}

The constant search for knowledge and its apprehension give nurses greater confidence and scientific rigor that supports the development of a good work practice, being expressed in their discourse and even in the performance of their activities.

Before the abovementioned considerations, the interviewed nurses evidenced the importance of the use of collagenase in treatment of PIs, but they emphasize the importance of its use and indication to be guided by criteria, bearing in mind the great contribution of the ointment for wound treatment, to reach good results in shorter times, and the easy access to the product, as can be seen in the following statements:

I indicate collagenase, yes, because I know the moment to use it. We must know when to use it, if I know about the ointment, I can use it with confidence. (NUR. 14)

Collagenase is a great debriding ointment; whenever I can opt for it, I do it, in the cases when there is an indication. Sometimes some medical professionals prescribe it improperly, but the nurses' evaluation is always important in these cases, for we are monitoring the injury and its progression. (NUR.19)

I do not see any reason for not using collagenase, if we are cautious, and of course, knowing when to use it, it will certainly have its function. The problem is that many people use the ointment without knowing when to use it. (NUR. 20)

Because collagenase is an easily accessible and affordable debriding agent presented as a topical ointment that acts in injured areas by removing necrotic tissue, this substance is part of the work routine of professionals who want to achieve healing of pressure injuries.

As a consequence of these characteristics, though, collagenase ends up being used on too many occasions, without possible scientific basis for its use.²²

In this context, it should be considered that treatment of wounds is considered a multidisciplinary practice and requires joint action of health professionals. However, nursing professionals, and more precisely the clinical nurses, are the ones who are at the forefront of the decision-making process in wound care, and decision-making related to coverings and substances used for evolution of the injury.²³

This fact guarantees the autonomy of nurses and their valorization in the assistance they provide. On the other hand, it also ends up demanding greater responsibilities and more knowledge of them. Nurses must be attentive to such problem, performing correct and accurate nursing diagnosis, so that a possible indication can be made in a cohesive way, bringing benefits to the patients.

♦ Contribution of improvement of knowledge enhancement in wound treatment

In this category, the nursing professionals spoke about the contribution of continuing education within the area of wound care, highlighting the importance of training courses and postgraduate courses with an emphasis on dermatological care, and constant search for information on new technologies that are constantly being launched to expand and improve wound care.

It contributes a lot. Exactly, because you are updated about forms of dressings, how to do the correct dressing, what should be the best to be used to achieve healing of the wound in a faster way, so everything is very important, to seek training inside this context. (NUR. 5)

It contributes, surely, because if you do not have knowledge of coverings, how to get it, how to treat, you will not be able to offer to patients adequate care, you will not know how to provide care in case of wounds in the right way, or at least to evaluate. (NUR. 11)

It contributes very much. Because it will leave you aware of what you are doing, you will not work mechanically; you will learn and know why you are doing it. (NUR. 18)

I did one on Dermatology turned only to wounds and you learn a lot more, you study a lot, you happen to have a specialist look, which is differentiated from the generalist look. It's different, it makes a difference, sure, of course that to treat a wound you do not necessarily need to be an expert, but if you want to know more, if you want to act more, act with that sort of problem, really,

you have to do a specialization in wounds, I find it imperative. (NUR. 6)

Search for knowledge must be something present in the life of any human being if the goal is to grow, regardless of the context. This is not different in nursing, where professionals who wish to grow within its respective area of action, must constantly update themselves in front of emerging innovations in the field of care. The daily world of nursing professionals is a place of production of knowledge of excellent quality, where the opportunity for improvement and discussion of practices is great.²⁴

Nurses are professionals that are a reference for having scientific knowledge of nursing, where science and care go under determination and systematization of the practices inherent to the performance of these professionals as individual participants in the process of caring for the users of the health system. Therefore, seeking to improve more and more is necessary to develop their work with excellence, and for being recognized by their practice by those who are the focus of their assistance: the patients.²⁴

CONCLUSION

It is clear from the speeches of the interviewed professionals that there is a need to improve the knowledge of nurses who care for patients who live with pressure injuries and who make use of collagenase as a form of treatment.

In addition, having an enhanced understanding, dynamicity and mastery of the evaluation criteria regarding the care of pressure injuries and the process of choosing a covering for treatment is something that must be inherent in clinical nurses who deal with such wounds, so that care given to the patients affected by this type of injury will consequently become more complete, individualized and decisive.

It should be emphasized that nursing, like any other science, has undergone several modifications in terms of scientific evolution. There is a continuous need for professionals who are more and more prepared to practice care, teaching, as well as management and research, aiming at the improvement of the knowledge and quality of patient care under the responsibility of the category.

Thus, when dealing with the treatment of wounds and dressings within the field of dermatological nursing, a very promising area, we verified that technological advances in coverings and other materials used in dressings have increased.

It is necessary to publish more studies aimed at the treatment of pressure injuries,

as well as on the use of collagenase in the practice. It is also evident the importance of the scientific and practical foundation of nurses to deal with such innovations in their work routine, from the simplest forms of dressings to the most complex ones.

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Corresponding Address

Thalys Maynnard Costa Ferreira
Rua Dr. Antônio Marinho Correia, 164
Bancários
CEP: 58052-569 — João Pessoa (PB), Brazil