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Preventing pressure ulcers in patients in intensive care units

Prevenção de lesões por pressão nos doentes em unidades de cuidados intensivos

Prevención de úlceras por presión en pacientes en unidades de cuidados intensivos

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ABSTRACT
Objective: to identify nurses' knowledge and attitudes about pressure injury prevention in patients in the intensive care unit. **Method:** a bibliographic search was carried out in April 2020, in the EBSCOhost platform (selecting the Academic Search Complete, CINAHL Complete and MedicLatina databases), in MEDLINE (through the Pubmed platform), in Scopus and in Web of Science. After application of the inclusion and exclusion criteria, eight primary articles were examined. **Results**: the nurses' level of knowledge proved to be insufficient and their attitudes, positive. The main influencing factors were age, years of professional experience, education and training in pressure injuries. **Conclusion:** the nurses' level of knowledge regarding the prevention of pressure injuries needs to be assessed and educational programs, created and implemented.
Descriptors: Nursing; Pressure Ulcer; Intensive Care; Knowledge.

RESUMO
Objetivo: identificar o nível de conhecimento e quais as atitudes dos enfermeiros sobre a prevenção de lesões por pressão nos doentes em unidades de cuidados intensivos. **Método:** foi realizada pesquisa bibliográfica em abril de 2020, na plataforma EBSCOhost, selecionando as bases de dados Academic Search Complete, CINAHL Complete e MedicLatina, na MEDLINE, através da plataforma Pubmed, na Scopus e na Web of Science. A partir da aplicação dos critérios de inclusão e exclusão, foram analisados oito artigos primários. **Resultados:** o nível de conhecimento dos enfermeiros demonstrou ser insuficiente e as suas atitudes positivas. Os principais fatores influenciadores foram: idade, anos de experiência profissional, formação/educação e treino na área das lesões por pressão. **Conclusão**: há necessidade da avaliação do nível de conhecimento dos enfermeiros relativamente à prevenção de lesões por pressão e da criação/implementação de programas educativos.
Descritores: Enfermagem; Lesão por Pressão; Cuidados Intensivos; Conhecimento.

RESUMEN
Objetivos: identificar el nivel de conocimientos y actitudes de los enfermeros sobre la prevención de úlceras por presión en enfermos en unidades de cuidados intensivos. **Método:** se realizó una búsqueda bibliográfica en abril de 2020, en la plataforma EBSCOhost, en las bases de datos Academic Search Complete, CINAHL Complete y MedicLatina, en MEDLINE, a través de la plataforma Pubmed, de Scopus y de la Web of Science. A partir de la aplicación de los criterios de inclusión y exclusión, se analizaron 8 artículos primarios. **Resultados:** el nivel de conocimiento de los enfermeros se mostró insuficiente pero sus actitudes fueron positivas. Los principales factores de influencia fueron la edad, los años de experiencia profesional, la formación/educación y la capacitación en el campo de las úlceras por presión. **Conclusión**: es necesario evaluar el nivel de conocimiento de los enfermeros en relación con la prevención de úlceras por presión y de la creación/aplicación de programas educativos.
Descriptores: Enfermería; Úlcera por Presión; Enfermería; Cuidados Intensivos; Conocimiento.

INTRODUCTION

Pressure ulcers (PUs) are a public health problem worldwide and indicate the quality of the health care provided, which can be developed in any health care context. Although 95% of the PUs are avoidable through early risk identification, this procedure is not systematically performed in all health units[1].

The most recent epidemiological data, to the date of the research, regarding the prevalence of PUs in Europe date back to 2006, from the study carried out by the National Group for the Study and Advice on Pressure Ulcers and Chronic Wounds. This study indicates that, in the hospital setting, the prevalence of PUs varies according to the type of care unit, with a value of 13.2% in ICUs[2].

According to the recent guidelines of the National Pressure Ulcer Advisory Panel (NPUAP), a PU is [...] a localized injury to the skin/or underlying tissue, generally over a bony prominence or related to a medical device or other. (...) The injury is the result of intense and/or prolonged pressure or of pressure combined with shear [...][3: 586].

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Nurses play a crucial role in preventing the development of PUs by putting into practice preventive measures such as risk assessment, proper positioning, decubitus change, use of support surfaces, and adequate nutrition. In order for them to carry out a correct risk assessment, ensuring interventions for the prevention of PUs in patients under their responsibility, as well as the selection of the appropriate therapeutic options for the treatment, it is fundamental that they have the necessary knowledge about the etiology and pathophysiology of Pus, as well as of preventive care measures[2]. However, there sometimes seems to be a gap between scientific knowledge and its clinical application, considering the high incidence and prevalence rates[4].

Another factor that exerts an influence on the process to prevent PUs is the nurses' attitudes. Unlike the interventions, they are not directly observable, although they exert a significant impact on the person's behavior. Therefore, the attitudes are variables that shape the behaviors, hence the importance of their assessment, allowing to anticipate such behaviors[5].

According to the *European Pressure Ulcer Advisory Panel* (EPUAP), the *National Pressure Injury Advisory Panel* (NPIAP) and the *Pan Pacific Pressure Injury Alliance* (PPPIA)[6], health organizations should implement the best practices in the clinical context. To such end, health professionals' knowledge level about PUs, as well as their attitudes regarding the problem, must be assessed, facilitating the implementation of an educational program.

Awareness about the problem, a positive attitude regarding prevention, and an adequate knowledge level are the basis for effective prevention, reducing the risk of complications[7].

Given the above, this study has the following review question: "What are the nurses' knowledge level and attitudes about the prevention of PUs in patients in ICUs?". Based on that question, the following objective was defined: to identify the nurses' knowledge level and attitudes about the prevention of PUs in patients in ICUs.

METHOD

This paper consists of an Integrative Literature Review (ILR), which gathers the existing empirical or theoretical literature to the present day about a specific phenomenon or health problem in order to criticize and synthesize it. This type of literature presents the state-of-the art in science and promotes theoretical development[8].

The elaboration of the review question was based on the PI[C]OD method, acronym for: P - Participants (Who was studied?); I - Interventions (What was done?); C - Comparisons; O - Outcomes (Results, effects or consequences of the interventions); and D - Study Design (How the evidence was collected)[9]. The elements of this acronym are extremely important in the process of elaborating the review question, as they allow maximizing research in the databases.

The PI[C]OD method inherent to the review question is described in Figure 1.

P	Participants	Nurses working in the Intensive Care Units
I	Interventions	Assessment of the level of knowledge and attitudes about the prevention of pressure ulcers
[C]	Comparisons	Not applicable
O	Outcomes	Level of knowledge and attitudes about the prevention of pressure ulcers in Intensive Care Units
D	Study design	Quantitative and qualitative primary studies

FIGURE 1: Método PI[C]OD inerente à questão de investigação. Coimbra, Portugal, 2020.

The ILR was carried out through a bibliographical research in the time interval from April 6th to April 10th, 2020, on the EBSCOhost platform, selecting the Academic Search Complete, CINAHL Complete, and MedicLatina databases in MEDLINE; through the Pubmed platform, in Scopus and Web of Science, using the following Health Sciences Descriptors (*Descritores em Ciências da Saúde*, DeCS): *pressure ulcer, intensive care unit, critical care nursing, prevention, nurse, patients, critical care, knowledge, attitude, perception,* and the following natural language terms*: bedsore, bed sore, decubitus ulcer, pressure sore, critically ill, wound, nursing care, ICU, intensive care, intensive therapy, intensive therapy unit, critically ill patient, nursing, prevent*, *preventing, belief, view*. They were combined to the Boolean operators "AND" and "OR" and the necessary truncations were used to obtain a comprehensive research.

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The research expression used was the following: (TI/AB) (*knowledge* or attitude* or perception* or belief* or view**) AND (TI/AB) *(nursing or nurse* or "nursing care" or "nursing intervention" or "nursing interventions" or "critical care nursing")* AND (TI/AB) *(prevention or prevent* or preventing)* AND (TI/AB) *("pressure ulcer" or "pressure ulcers" or "pressure sore" or "pressure sores" or bedsore* or "bed sore" or "bed sores" or "decubitus ulcer" or "decubitus ulcers")* AND (TI/AB) *(ICU or "intensive care unit" or "intensive care units" or "critical care" or "intensive care" or "intensive therapy" or "intensive therapy unit" or "intensive therapy units" or "critically ill" or "critically ill patient" or "critically ill patients").*

In order to maintain coherence with the review question, the following was included in this research: studies whose participants were ICU nurses; whose phenomenon of interest was the nurses' knowledge level and attitudes about the prevention of pressure ulcers in patients in ICU; primary, quantitative and qualitative studies; published between 2015 and 2020, in Portuguese, English, Spanish, and French; and available in full text.

Studies conducted exclusively with other health professionals or with nurses in the pediatric context were excluded.

With the research, an initial sample of 85 articles was obtained, of which, 21 duplicate articles were excluded, as well as 49 after applying the inclusion and exclusion criteria, 3 after reading the abstracts, and 4 after the reading them in full, obtaining a total of 8 articles selected for the ILR. The full analysis of the articles was carried out by two reviewers, independently, in order to verify the relevance of the studies. Figure 2 presents the flowchart corresponding to the article selection process.

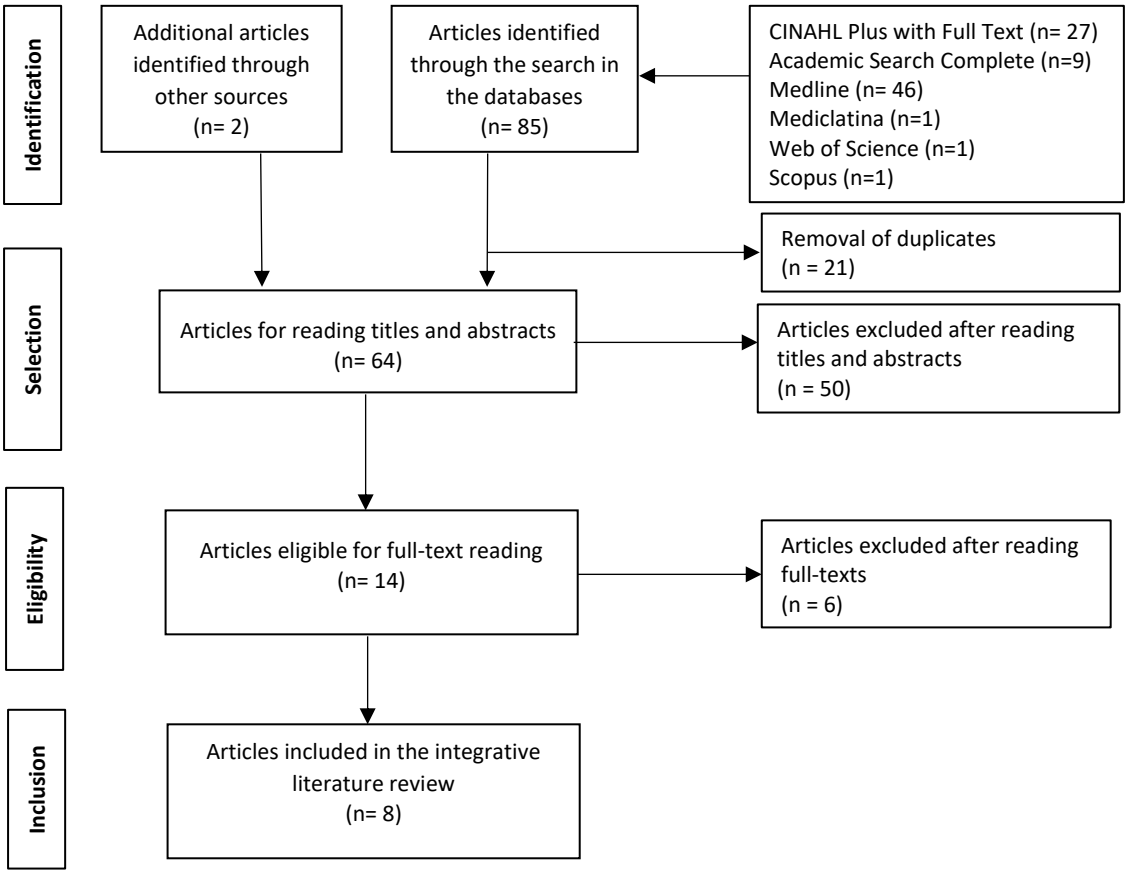

FIGURA 2: Flowchart corresponding to the study selection process. Coimbra, Portugal, 2020.

Research studies referred to by the studies selected, as well as non-indexed studies found by the researchers and considered relevant to the theme were also selected for this research.

The articles selected are presented in Figure 3, identified by the letters “C”, “M”, “S” or “W” according to whether they were found in the CINAHL Complete, MEDLINE, Scopus or Web of Science databases, respectively, and numbered according to the chronological order of publication.

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Study	Title	Authors	Country / Year	Journal
C1	Knowledge of Nurses Working in Intensive Care Units in Relation to Preventive Interventions for Pressure Ulcer	Köse, I, Yeşil, P., Öztunç, G., & Eskimez, Z.	Turquia, 2016	International Journal of Caring Sciences
W2	Pressure Injury Prevention in a Saudi Arabian Intensive Care Unit	Tayyib, N., Coyer, F., & Lewis, P.	Arábia Saudita, 2016	Journal of Wound, Ostomy and Continence Nursing
M3	Knowledge of the nursing team on pressure ulcer prevention	Galvão, N. S., Serique, M. A. B., Santos, V. L. C. G., & Nogueira, P. C.	Brasil, 2017	Revista Brasileira de Enfermagem
C4	Pressure Injury Prevention: Knowledge and Attitudes of Iranian Intensive Care Nurses	Tirgari, B., Mirshekari, L., & Farouzi, M.A.	Irão, 2018	Wound Care Journal
C5	Attitudes of intensive care nurses towards pressure ulcer prevention	Habiballah, L.	Jordânia, 2018	Clinical Nursing Studies
M6	Critical Care Nurses' knowledge, attitudes, and perceived barriers towards pressure injuries prevention	Batiha, A.	Jordânia, 2018	International Journal ofAdvanced Nursing Studie
C7	Knowledge and Attitudes Towards Prevention of Pressure Ulcer: Intensive Care Units Sample in Turkey	Yilmazer, T., Tüzer, H., & Erciyas, A.	Turquia, 2019	Turkiye Klinikleri Journal of Nursing Sciences
S8	Factors related to knowledge, attitude, and practice of nurses in intensive care unit in the area of pressure ulcer prevention: A multicenter study	Khojastehfar, S., Ghezeljeh, T. N., & Haghani, S	Irão, 2020	Journal of Tissue Viability

FIGURE 3: Identification of selected articles. Coimbra, Portugal, 2020.

RESULTS AND DISCUSSION

The eight articles selected are cross-sectional, descriptive and quantitative studies, were developed in the ICU context, and their participants are nurses. Regarding the methodology used, all the studies applied a questionnaire consisting in several assessment instruments in order to obtain the nurses' answers related to their knowledge level and attitudes about the prevention of PUs.

The instruments used in most of the studies to assess the attitudes and knowledge level are as follows: *Attitude Towards Pressure Ulcer Prevention* (APUP), also known as *Attitude Toward Pressure Ulcer Tool*, and *Pressure Ulcer Knowledge Tool* (PUKT), also known as *Pieper Pressure Ulcer Knowledge Test* or as *Pressure Ulcer Knowledge Assessment Tool*[10-15]. All are validated for the different countries in which the studies were conducted[16].

Articles M3, C4, M6, C7 and S8 show that nurses had an insufficient knowledge level about prevention of PUs[11-15]. These data are supported in previous research studies carried out in Belgium and Cyprus, in which the authors concluded that the nurses had a knowledge deficit about the prevention of PUs[16,17]. Another study also identified that ICU nurses did not have sufficient knowledge level, and the authors recommended the elaboration of educational programs about the theme for the professionals[18]. Such suggestion is acknowledged by the authors of articles M3 and M6[11,13].

This recommendation is also present in the guidelines from NPUAP, EPUAP and PPPIA, which assert that health organizations must regularly offer training based on the most recent scientific evidence about PUs through educational programs[19].

Of the articles that assessed knowledge level, only C1 revealed that nurses had a relatively sufficient knowledge level about prevention of PUs. The authors point out the use of the *Pressure Ulcer Preventive Interventions Information Form* instrument, prepared by them and based on the *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide*, developed by EPUAP and NPUAP, as one of the possible causes for the results obtained since, in most of the existing literature, the instrument used is PUKT, which is already validated in different countries, unlike the instrument used in article C1[20].

It was possible to identify factors that exert an influence on the knowledge level, such as years of professional experience, qualification/education, and training in the PU area, present in articles C1, C4, M6 and S8[12,13,15,20]. The third most mentioned factor was age, identified in articles C1 and C4 as an influencing element of knowledge level[12,20].

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The highest knowledge levels are associated with more years of professional experience, since they provide more contact with the problem[21]. Qualification and specific training in the PU area are also reported in another study, in which it is possible to verify that nurses with this type of training had higher knowledge levels (51.3%) when compared to those who had not done the same (47.7%)[16]. Regarding age, in a study carried out in Brazil, the results show that the level of knowledge about PU prevention was higher in nurses aged between 30 and 60 years old, when compared to nurses aged less than 30 years old, and this relationship was evidenced by a p-value < 0.05[22].

The authors of articles W2, C4, C5 and M6 verified that the nurses who participated in their studies had positive attitudes[10,12,13,23], contrary to what was observed in articles C7 and S8, in which the most of the professionals showed having negative attitudes[14,15].

Previous studies corroborate the results obtained in articles W2, C4, C5 and M6, as the nurses' attitudes related to PU prevention in these studies proved to be positive[5,17].

On the other hand, in the literature there are also articles corroborating the results obtained in C7 and S8, such as the study carried out in Belgium, in which only half of the nurses showed having positive attitudes related to the theme[14-16].

In most of the articles found, the nurses presented positive attitudes, and these differences in the results may result from the fact that, regardless the assessment instruments used are different or identical, their cutoff points are different[14,15].

Regarding the factors that influence the nurses' attitudes, articles C5 and S8 report that the female participants present better attitudes related to PU prevention, as well as those with more years of professional experience[15,23]. In addition, the authors of article M6 state that the best attitudes are found in nurses with more years of general or ICU[13] experience. Another factor presented by the authors or article C5 is the fact that the nurses had undergone recent specific training regarding the theme[23].

The results obtained in previous studies evidence a positive correlation between the years of professional experience and the attitudes related to PU prevention, that is, it is expected that the more years of professional experience of a nurse, the more favorable their attitudes will be, supporting the data obtained in article M6[13].

On the other hand, recent specific training in the area is positively correlated with the nurses' attitudes. In the study whose authors came to this conclusion, the nurses who underwent specific training in the PU prevention area, up to 6 months before applying the questionnaire assessing the attitudes, presented higher percentages regarding positive attitudes when compared to those who had done so more than 2 years ago, in line with article C5[23].

Regarding the relationship between knowledge level and attitudes, only articles C4, C7 and S8 analyzed this type of relation, that is, how knowledge level can influence the attitudes related to PU prevention[12,14,15]. From the results obtained, it was possible to verify that articles C4 and S8 showed a positive correlation between the variables, both presenting a p-value < 0.001 (significance level: p-value < 0.05), whereas article C7 evidenced the opposite, a negative correlation between them, even if weak, evidenced by p-value < 0.05 (significance level: p-value < 0.05)[14].

In a study about the nurses' knowledge level and attitudes related to PU prevention, the authors verified a positive correlation between the variables, that is, the greater the knowledge level, the more favorable their attitudes will be (p-value = 0.019). They also argue that, by increasing knowledge level through educational programs, there is the possibility of improving the nurses' attitudes, which corroborates the aforementioned information[17]. The authors of the study carried out in Belgium also identified a positive correlation between the nurses' knowledge level and their attitudes (p-value < 0.001), corroborating the data obtained in the articles selected[16].

On the other hand, article C7 evidenced that negative or inadequate attitudes increase proportionally with knowledge level, this data being justified by the authors. They state that the correlation identified is weak and point to the individual characteristic of each nurse as a possible cause, asserting that they are preponderant to obtain positive attitudes when compared to knowledge level[14].

CONCLUSION

It is possible to conclude that, in general, the nurses' knowledge level related to the PU prevention is insufficient, and the main factors that influence it are age, years of professional experience, qualification/education and specific training the area of PUs.

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Most of the nurses showed having positive attitudes related to the theme under study, presenting the following as their main influencing factors: years of professional experience in general and in ICU, and specific training in the area of PU prevention.

Considering that only three of the articles selected assessed the existence of a correlation between the nurses' knowledge level and attitudes related to PU prevention, in which two presented a positive correlation between the variables and one a statistically weak negative correlation, it is not possible to draw any conclusion regarding the underlying objective. Therefore, we consider it important to expand research regarding this specific point.

The need to frequently assess the knowledge level related to PU prevention in order to identify the professionals' needs is observed, working on them through the elaboration of protocols including skin assessment, risk of developing Pus and nutritional risk, among other aspects, as well as the creation and implementation of educational programs by the health organizations, promoting practices based on the most recent scientific evidence. Considering the specificity of the ICUs, it will also be important to assemble a work group that only develops training sessions in this area.

In summary, the literature analyzed allowed concluding that the nurses' knowledge, integrated in the categories about etiology, classification and observation, risk assessment, nutrition, and PU prevention, is insufficient. The attitudes, such as personal skills, responsibility and confidence in prevention effectiveness, as well as the priority given to PU prevention and to the perception of its impact are positive. Factors such as age, years of professional experience, qualification/education and training in the PU area exert an influence on the nurses' knowledge level and attitudes. Finally, it was not possible to verify the existence of a correlation, either positive or negative, between knowledge level and attitudes.

This paper allowed understanding the importance of keeping the nurses' knowledge updated, promoting awareness raising regarding this problem and, consequently, improving their attitudes towards theme.

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