

## Pressure injury prevention measures in pediatric wards: nursing professionals' actions\*

### Medidas de prevenção de lesão por pressão em enfermarias pediátricas: atuação dos profissionais de enfermagem

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#### ABSTRACT

**Objective:** to classify the quality of nursing care and analyze the association between professionals' characteristics and the implementation of preventive measures for pressure injuries in hospitalized children. **Methods:** this observational, cross-sectional study involved 235 nursing professionals. The Pressure Injury Prevention instrument comprised three domains with a total of 23 items: Preventive measures and early detection of pressure injuries (9 items), Pressure relief measures (8 items), and Assessment and reporting (6 items), analyzed using the Positivity Index for Quality of Care. **Results:** Most participants were females (98.7%), with a mean age of  $38.83 \pm 9.94$  years, nursing technicians (57.4%), and had more than five years of experience (77.1%). Nursing care was predominantly inadequate across all three domains, with 82.6% of actions rated as poor. Significant associations were found between “participation in training courses” and “work-related exhaustion”. There was a trend towards increased compliance with measurements among professionals aged 31-40. **Conclusion:** nursing care was predominantly poor and participation in training courses and the presence of exhaustion were associated with better adherence to preventive measures. **Contributions to practice:** the study highlights the pressing need for investments in professional training and the provision of necessary resources to support high-quality and safe nursing care. **Descriptors:** Patient Safety; Quality of Health Care; Pressure Ulcer; Pediatrics; Nursing.

#### RESUMO

**Objetivo:** classificar a qualidade da assistência de enfermagem e analisar a associação entre as características dos profissionais e a execução de medidas preventivas de lesão por pressão em crianças hospitalizadas. **Métodos:** estudo observacional, transversal, realizado com 235 profissionais de enfermagem. O instrumento de Prevenção de Lesão por Pressão possui três domínios, com 23 itens: Medidas preventivas e detecção precoce de lesão por pressão (9); Medidas de alívio de pressão (8) e Avaliação e notificação (6), analisados pelo Índice de Positividade para Qualidade da Assistência. **Resultados:** predominou sexo feminino (98,7%), com idade média de  $38,83 \pm 9,94$  anos, técnicos de enfermagem (57,4%) e com tempo de experiência profissional superior a cinco anos (77,1%). Constatou-se assistência predominantemente sofrível nos três domínios, em 82,6% das ações. Encontrou-se associação significativa com as variáveis “participação em cursos” e “desgaste no trabalho” e uma tendência mais frequente de realização das medidas na faixa etária 31-40 anos. **Conclusão:** a assistência de enfermagem foi predominantemente sofrível; a assistência associou-se à participação em cursos de aperfeiçoamento e desgaste no trabalho. **Contribuições para a prática:** evidenciou-se a necessidade do investimento em capacitação profissional e oferta de insumos considerados indispensáveis para viabilizar uma assistência qualificada e segura. **Descritores:** Segurança do Paciente; Qualidade da Assistência à Saúde; Lesão por Pressão; Pediatria; Enfermagem.

## Introduction

The incidence of pressure ulcers has increased in recent years and is considered an adverse event with a major social and economic impact, leading to prolonged hospitalization, which reduces the patient's quality of life and increases the cost of care provided by healthcare facilities<sup>(1)</sup>. These injuries can occur as a result of intense, prolonged pressure or pressure combined with shear<sup>(2)</sup>.

The occurrence of lesions has a multifactorial origin, ranging from the patient's own characteristics to factors related to the external environment<sup>(3)</sup>. Although historically described as a problem unique to the adult and geriatric populations, the incidence of hospital-acquired pressure injuries has increased in the pediatric population<sup>(4)</sup>. Risk factors for this population include a more severe clinical condition and prolonged hospitalization; among the main clinical conditions, cardiac and neurological disorders, Down syndrome, prematurity, myelomeningocele and hydrocephalus correlated with neurogenic bladder stand out<sup>(5)</sup>. In this population, lesions are more frequent in the cephalic and sacrococcygeal regions, mainly affecting preschool children who are hospitalized<sup>(6)</sup>.

Among the various methods that can be used to modify this reality, two important approaches are the adoption of standardized care protocols, which has shown positive contributions in reducing the occurrence of pressure injuries in pediatric patients<sup>(4)</sup>, and the utilization of instruments to identify potential risk factors inherent to each individual and enable the implementation of specific interventions based on the findings<sup>(7)</sup>.

Considering that pressure ulcers are an indicator of the quality of care<sup>(8)</sup>, it is important to measure the frequency of implementation of good preventive practices and, consequently, the quality of this care, in order to monitor processes and provide information for future changes.

Considering the above, an instrument for the Prevention of Pressure Injuries in Pediatrics (PPIP) has been developed and validated, consisting of 23 items covering the following domains: Preventive measures and early detection of pressure injuries, Pressure relief measures, and Assessment and reporting<sup>(9)</sup>. This instrument makes it possible to identify the actions carried out by professionals, allowing the perception of aspects of fragility and the classification of the quality of care. Given the above, this study aimed to classify the quality of nursing care and analyze the association between professionals' characteristics and the implementation of preventive measures for pressure injuries in hospitalized children.

## Methods

This observational, cross-sectional, quantitative study was conducted according to the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE). The research took place in three public hospitals with pediatric care, located in Fortaleza, Ceará, Brazil.

The population consisted of 355 professionals working in the open pediatric units of the three hospital institutions, including those who had at least six months of practical experience with hospitalized children. A total of 120 nurses were excluded from the study: 22 were on vacation, leave, or absent from work during the survey period, 65 did not return the completed instrument within the specified period, 17 returned the instrument with incomplete information, and 16 refused to participate in the study.

Non-probabilistic sampling was used to select the sample, which consisted of 235 nursing professionals, including 72 nurses, 135 technicians and 28 nursing assistants, representing the total number of professionals working in the three institutions.

Data collection took place from February to June 2018, in open pediatric hospitalization units, seven days a week, in day and night shifts, according to

the availability of researchers previously trained to apply the PPIP and the professional characterization form, which comprised the following variables: sex, age, professional training, time since graduation, length of professional experience in pediatrics, weekly workload, participation in training courses, and work-related exhaustion. The instruments were delivered individually to the professionals and the estimated time to complete them was approximately 15 minutes. However, the demands of the sectors made it impossible to collect them within the estimated time, and it was agreed that the completed instrument would be returned the day after it was received or on the next shift of the professional.

The PPIP instrument underwent a previous validation process, including content validity evaluated by specialists, yielding an overall Intraclass Correlation Coefficient of 0.983. Furthermore, for simplicity, clarity, and relevance, the coefficients obtained were 0.954, 0.945, and 0.955, respectively. The internal structure validity was confirmed through factor analysis and contrasted group analysis (Kaiser-Meyer-Olkin of 0.911 and Bartlett's sphericity with  $p < 0.0001$ ). Additionally, the instrument's reliability was assessed through internal consistency, resulting in a Cronbach's alpha of 0.938<sup>(9)</sup>.

The instrument comprises a total of 23 items categorized into three domains: Preventive measures and early detection of pressure injuries (9 items), Pressure relief measures (8 items), and Assessment and reporting (6 items). Each item is rated on a Likert scale with five response options: 1 – Never, 2 – Almost never, 3 – Sometimes, 4 – Almost always, and 5 – Always. A higher score indicates a greater degree of prevention in terms of pressure injuries<sup>(9)</sup>.

The PPIP instrument identifies the actions carried out by nursing professionals in preventing pressure injuries and facilitates analysis using the Positivity Index (PI) for Quality of Care<sup>(10-11)</sup>. The PI denotes the percentage of positive responses for each action, and the categories used to classify the quality

of care<sup>(11)</sup> are as follows: desirable assistance (PI = 100%), adequate (PI between 90% and 99%), safe (PI between 80% and 89%), borderline (PI between 71% and 79%), and poor (PI  $\leq$  70%)<sup>(10)</sup>. In the present study, only the option "always" was considered as a positive (adequate) response, indicating that the action is consistently performed in daily care, while the remaining options were categorized as "inadequate."

Data analysis was carried out in SPSS 20.0, under license n<sup>o</sup> 10101131007 Descriptive statistics were employed to provide an overview of the data, including calculations for absolute and percentage frequencies, means, and standard deviations for numeric variables (age, time since graduation, length of professional experience and weekly workload). The Positivity Index and the classification of quality of care were determined based on frequency distributions. The association between the scale and the variables was examined using the Chi-square test (when fewer than 20% of the cells had expected frequencies  $< 5$ ) and the likelihood ratio test for cases where this number exceeded 20%. Additionally, the Chi-square test for tendency in proportion was used to analyze the relationship between the scale and ordinal variables. A significance level of 5% was applied to all inferential analyses.

The project received approval from the Research Ethics Committee of the Federal University of Ceará, as evidenced by the Certificate of Presentation of Ethical Appreciation No. 79358717.0.0000.5054 and Opinion No. 2,440,646/2018.

## Results

Table 1 presents the frequency of pressure injury prevention actions carried out by the nursing team, categorized according to the PPIP domains. The distribution of responses was evaluated using the Chi-square test ( $p < 0.0001$ ;  $df$  – Degree of freedom = 1), revealing a significant increasing trend from the "Never" response option to the "Always" option.

**Table 1** – Distribution of nursing professionals' answers according to the actions of the domains of the Pressure Injury Prevention instrument in Pediatrics (n=235). Fortaleza, CE, Brazil, 2018

Items	Never	Almost never	Sometimes	Almost always	Always*	p <sup>†</sup>
<b>Domain 1: Preventive measures and early detection of pressure injuries</b>						
1. Inspect the child's skin upon admission for pressure sores or pre-existing lesions.	25 (10.6)	6 (2.6)	17 (7.2)	31 (13.2)	156 (66.4)	< 0.0001
2. Examine the child's skin daily for signs of pressure injuries.	29 (12.3)	12 (5.1)	25 (10.6)	39 (16.6)	130 (55.3)	< 0.0001
3. Cleanse the child's skin when it is dirty or as necessary.	13 (5.5)	1 (0.4)	8 (3.4)	19 (8.1)	194 (82.6)	< 0.0001
4. Instruct the caregiver on how to clean the child's skin when it is dirty or as necessary.	25 (10.6)	2 (0.9)	10 (4.3)	24 (10.2)	174 (74.0)	< 0.0001
5. Apply moisturizer to dry skin and areas at least once a day.	37 (15.7)	15 (6.4)	34 (14.5)	36 (15.3)	113 (48.1)	< 0.0001
6. Avoid massaging areas with bony prominences or areas with hyperemia.	47 (20.0)	9 (3.8)	16 (6.8)	34 (14.5)	129 (54.9)	< 0.0001
7. Protect the skin from excessive moisture using barrier products such as diapers or pads.	29 (12.3)	4 (1.7)	13 (5.5)	26 (11.1)	163 (69.4)	< 0.0001
8. Avoid placing the child directly over probes, drains, or bony prominences with non-reactive hyperemia.	23 (9.8)	1 (0.4)	6 (2.6)	12 (5.1)	193 (82.1)	< 0.0001
9. Use dressings to protect bony prominences based on the child's needs.	43 (18.3)	6 (2.6)	16 (6.8)	26 (11.1)	144 (61.3)	< 0.0001
<b>Domain 2: Pressure relief measures</b>						
10. Change the child's position every two hours.	24 (10.2)	8 (3.4)	22 (9.4)	32 (13.6)	149 (63.4)	< 0.0001
11. Reposition the child using the semi-Fowler position (30°) or lateral position (30°). For tracheostomized children on non-invasive ventilation, maintain the head of the bed at an angle > 30°.	30 (12.8)	6 (2.6)	9 (3.8)	27 (11.5)	163 (69.4)	< 0.0001
12. Provide support under the child's feet when they are sitting, and their feet are off the floor.	32 (13.6)	16 (6.8)	30 (12.8)	36 (15.3)	121 (51.5)	< 0.0001
13. Provide pressure redistribution surfaces (e.g., beds and mattresses) for all children classified as "at risk."	40 (17.0)	11 (4.7)	11 (4.7)	29 (12.3)	144 (61.3)	< 0.0001
14. Provide support surfaces (e.g., cushion or pillow) to elevate and protect the heels.	35 (14.9)	10 (4.3)	24 (10.2)	38 (16.2)	128 (54.5)	< 0.0001
15. Provide pressure redistribution seating (e.g., air and foam cushions) for children sitting in wheelchairs with reduced mobility.	73 (31.1)	12 (5.1)	27 (11.5)	32 (13.6)	91 (38.7)	< 0.0001
16. Use padding or a mechanical lifting device to facilitate the movement and repositioning of bedridden children during transfers.	68 (28.9)	8 (3.4)	19 (8.1)	34 (14.5)	106 (45.1)	< 0.0001
17. Use a bulletin board next to the bed to encourage the child to change positions in bed when necessary.	111 (47.2)	12 (5.1)	30 (12.8)	15 (6.4)	67 (28.5)	< 0.0001
<b>Domain 3: Assessment and reporting</b>						
18. Assess the risk of developing pressure ulcers upon admission of the child using the Braden Q Scale (children aged 1 to 5 years) or the Braden Scale (children older than 5 years).	50 (21.3)	11 (4.7)	16 (6.8)	36 (15.3)	65 (27.7)	< 0.0001
19. Reassess the risk of developing a pressure injury daily for all hospitalized children using the Braden Q Scale or the Braden Scale.	40 (17.0)	12 (5.1)	19 (8.1)	37 (15.7)	72 (30.6)	< 0.0001
20. Evaluate the presence of clinical signs of malnutrition or indications that may predispose to changes in nutritional status.	14 (6.0)	5 (2.1)	12 (5.1)	36 (15.3)	132 (56.2)	< 0.0001
21. Notify the nutritionist of all children at nutritional risk or at risk of pressure ulcers.	26 (11.1)	12 (5.1)	18 (7.7)	27 (11.5)	92 (39.1)	< 0.0001
22. Record identified skin changes and interventions performed in the medical record.	13 (5.5)	4 (1.7)	8 (3.4)	20 (8.5)	190 (80.9)	< 0.0001
23. Notify the Risk Management and/or the Patient Safety Center (if applicable) in the event of a pressure injury development.	19 (8.1)	11 (4.7)	18 (7.7)	19 (8.1)	112 (47.7)	< 0.0001

\*Positivity Index (PI); †Chi-square test for trend in proportion

In Domain 1, six of the nine items showed poor nursing care (PI≤70%). The action “4 – Instruct the caregiver on how to clean the child’s skin when it is dirty or as necessary” achieved an adherence rate of 74%, indicating borderline assistance. Only two actions surpassed the 80% adherence threshold, denoting safe assistance, namely: “3 – Cleanse the child’s skin when it is dirty or as necessary” (82.6%) and “8 – Avoid placing the child directly over probes, drains, or bony prominences with non-reactive hyperemia” (82.1%).

In Domain 2, all nursing actions were deemed inadequate, revealing a deficiency in implementing pressure relief measures, which are essential for preventing injuries. Within Domain 3, only the action “22 – Record identified skin changes and interventions performed in the medical record” met the criteria for safe care (PI=80.9%), and the remaining items reflected instances of poor nursing care.

As presented in Table 2, among the 235 profes-

sionals, the majority were female (98.7%), with ages ranging from 31 to 50 years (56.6%), and a mean age of 38.83 ± 9.94 years. In terms of professional training, nursing technicians comprised the majority (57.4%), with an average of 12.98 ± 7.96 years of experience, predominantly in pediatrics (77.1%), with an average of 7.90 ± 6.26 years. Their weekly workload ranged from 21 to 40 hours (63%), with an average of 35.67 ± 11.15 hours.

When associating the PPIP scores with the variables that characterize the nursing professionals (Table 2), a significant correlation was identified between preventive measures for pressure injuries and participation in patient safety training courses (p=0.009; X<sup>2</sup> = 13.5; df = 4) and the absence of work-related exhaustion (p=0.047; LR = 15.7; df = 8). Additionally, there was a tendency for professionals aged between 31 and 40 years (p=0.017; X<sup>2</sup> = 5.70; df = 1) to perform pressure injury prevention actions more frequently.

**Table 2** – Association between the Pressure Injury Prevention instrument in Pediatrics and the characteristics of nursing professionals (n=235). Fortaleza, CE, Brazil, 2018

Variables	Total n(%)	Poor			Satisfactory		p
		Never n(%)	Almost never n(%)	Sometimes n(%)	Almost always n(%)	Always n(%)	
Sex							0.104*
Female	232(98.7)	14(6.0)	20(8.6)	43(18.5)	64(27.6)	91(39.3)	
Male	3(1.3)	0(0.0)	2(66.7)	0(0.0)	0(0.0)	1(33.3)	
Age range (years)							0.017‡
21-30	50(21.3)	3(6.0)	2(4.0)	10(20.0)	15(30.0)	20(40.0)	
31-40	78(33.2)	5(6.4)	7(9.0)	6(7.7)	20(25.6)	40(51.3)	
41-50	55(23.4)	3(5.5)	4(7.3)	14(25.5)	14(25.5)	20(36.2)	
51-70	52(22.1)	3(5.8)	9(17.3)	13(25.0)	15(28.8)	12(23.1)	
Professional qualification							0.195*
Nurse	72(30.6)	4(5.6)	7(9.7)	8(11.1)	27(37.5)	26(36.1)	
Technician	135(57.4)	9(6.7)	13(9.6)	27(20.0)	28(20.7)	58(43.0)	
Assistant	28(11.9)	1(3.6)	2(7.1)	8(28.6)	9(32.1)	8(28.6)	
Time of experience in pediatrics (years)							0.355‡
≤10	123(52.4)	8(5.0)	14(8.9)	23(14.6)	48(30.3)	65(41.2)	
11-20	73(31.1)	4(8.0)	4(8.0)	11(22.0)	12(24.0)	19(38.0)	
≥21	39(16.6)	2(7.4)	4(14.8)	9(33.4)	4(14.8)	8(29.6)	
Weekly workload (hours)							0.571‡
≤20	25(10.6)	1(4.0)	1(4.0)	3(12.0)	9(36.0)	11(44.0)	
21-40	148(63.0)	9(6.1)	16(10.8)	28(18.9)	39(26.4)	55(37.8)	
≥41	62(26.6)	4(6.5)	5(8.1)	12(19.4)	16(25.8)	25(40.2)	
Participation in training courses							0.009†
Yes	128(54.5)	8(6.3)	5(3.9)	21(16.4)	35(27.3)	59(46.1)	
No	105(44.7)	6(5.7)	17(16.2)	22(20.9)	28(26.7)	32(30.5)	
Work-related exhaustion							0.047*
Absent	25(10.6)	1(4.0)	2(8.0)	2(8.0)	2(8.0)	18(72.0)	
Mild	96(40.9)	6(6.3)	12(12.5)	17(17.7)	28(29.2)	33(34.4)	
High	114(48.5)	7(6.1)	8(7.0)	24(21.1)	34(29.8)	41(36.1)	

\*Likelihood ratio; †Pearson Chi-square; ‡Chi-square for trend in proportions

## Discussion

The study, despite being specific, evaluated the quality of nursing care based on professionals' responses regarding the implementation of pressure injury prevention measures, and most of this care was classified as inadequate. This finding is concerning and highlights the need for planning and implementing strategies to enhance quality and patient safety.

Measures related to the prevention and early detection of pressure injuries were poorly implemented by the professionals under analysis, indicating substandard nursing care. For instance, only 48.1% of professionals engaged in the action of moistening the child's skin. Conversely, the action of moisturizing dry skin was identified as the most frequently performed by nurses, with a Positivity Index of 90.9%, signifying appropriate care<sup>(8)</sup>.

The discrepancy mentioned above could be attributed to the higher occurrence of pressure injuries among children admitted to closed units. However, it is essential to recognize that children hospitalized in open units are also susceptible to developing these injuries. Therefore, it becomes imperative for ongoing education to promote and emphasize the importance of moisturizing the skin of hospitalized children, irrespective of the unit type.

Despite the shortage of nursing staff and nurses' dissatisfaction with their working conditions, the need for special attention to communication between nursing staff and patients is highlighted. This is recommended since the use of adequate communication skills can increase patients' satisfaction with nursing care and the true problems of these patients can be more easily identified and solved<sup>(12)</sup>. Hence, it is imperative for the nursing team to adopt a cohesive approach that promotes the active involvement of parents and family members in the care of children through effective communication. This can be achieved by implementing nursing guidelines that serve as guiding frameworks for collaborative care between the healthcare team and the responsible individuals

for the child, resulting in significant enhancements in the quality of care provided to pediatric patients<sup>(13)</sup>.

Despite the existing deficiency in communication between professionals and caregivers regarding child hygiene guidelines, the majority of professionals do adhere to the practice of cleaning the skin when it is soiled or as necessary. Among the various measures for pressure injury prevention, those pertaining to skin care are frequently implemented and well-documented in patient care, with skin cleaning being a commonly employed strategy by the nursing team to identify any changes in skin integrity<sup>(14)</sup>.

Apart from skin inspection, it is crucial to prioritize the practice of avoiding direct contact between the child's skin and medical devices, as well as bony prominences with non-reactive hyperemia, to prevent skin lesions. The professionals in the present study demonstrated proper adherence to this preventive measure. The adoption of this practice by the nursing team holds significant importance, considering that the frequent use of medical devices in the care of hospitalized children is a primary contributing factor to hospital-acquired skin injuries<sup>(15)</sup>.

Contrary to the findings of the present study, a survey conducted in eight pediatric hospitals in the United States revealed that, among the 6,336 implanted medical devices, 36% lacked any preventive intervention against injuries. Out of the 625 patients included in the analysis, 7% experienced one or more injuries, and the most common culprits for these injuries were respiratory devices, followed by immobilizers, gastric tubes, and external monitoring devices<sup>(16)</sup>.

Low adherence to positioning the child in bed and implementing changes in decubitus was observed in a study conducted in Spain. The study revealed that raising the head of the bed to a 30° angle was the least adopted preventive measure in the pediatric unit, with only 20% adherence<sup>(6)</sup>. While injuries caused by medical devices may prevail over those resulting from immobility, the redistribution of pressure on the skin through position changes remains a significant concern in the prevention of such injuries<sup>(17)</sup>.

A total of 86 injuries were detected in 49 individuals, with 22 of them attributed to immobility. The most commonly affected sites were the ribs, sacral region, buttocks, and head<sup>(15)</sup>. Among patients who developed pressure injuries, 12.5% were not repositioned in the days leading up to the appearance of the injuries. Furthermore, in 87.5% of cases, the interval between position changes exceeded 13 hours<sup>(6)</sup>.

Although the responsibility for changing the patient's position is primarily attributed to the nursing team, it is crucial to invest in educational initiatives that train caregivers or companions in this practice by decentralizing patient care and involving caregivers as active participants in pressure injury prevention measures<sup>(18)</sup>. Furthermore, healthcare institutions must be made aware of the significance of preventive measures and allocate resources towards acquiring and providing necessary physical resources, such as equipment and work materials, which enable the practical implementation of preventive measures and contribute to the reduction of pressure injury prevalence<sup>(1)</sup>.

Printed educational materials have been extensively employed as a health education strategy for information dissemination<sup>(19)</sup>. Nevertheless, this practice was not observed in the current study, as only a small portion of the team utilizes a notice board near the child's bed to encourage mobility. These findings are supported by a separate study that assessed the quality of care in an Intensive Care Unit, which also identified low adherence to this action among nurses, with even lower positivity rates reaching 9%<sup>(8)</sup>.

Despite the aforementioned findings, it is important to highlight that educational tools play a significant role in empowering companions to actively participate in the care of the child, engaging them in the prevention of errors and the identification of potential incidents that could harm the patient<sup>(20)</sup>. When educational strategies are designed to be interactive and engaging, they foster the development of responsibility and autonomy in children themselves, enabling them to become active participants in their own health-di-

sease process with a positive impact on the safety and quality of the healthcare services provided<sup>(18)</sup>.

In addition to educational tools, the utilization of measurement instruments in healthcare provides valuable support to nurses in making informed decisions regarding children at risk of pressure ulcers. These instruments can be integrated into the health institution's record system, facilitating the documentation of the care provided to the child<sup>(7)</sup>. Among the available instruments for assessing pressure injuries, the Braden Scale and Braden Q are the most commonly utilized<sup>(21)</sup>.

Despite the existence of standardized instruments that can be employed by pediatric nurses to identify patients at risk for pressure injuries<sup>(22)</sup>, only a minority of professionals utilized such an instrument during the child's admission, indicating suboptimal nursing care. This discrepancy may be attributed to the fact that these tools, despite their high accuracy when applied in pediatric wards, are predominantly used in the care of pediatric patients hospitalized in Pediatric Intensive Care Units<sup>(22)</sup>, while the present study was conducted exclusively in open units that had not yet implemented the routine use of risk assessment scales for pressure injuries in pediatric care.

One of the challenges in preventing pressure injuries is the inadequate documentation of preventive actions taken by nursing professionals. Although there is a high percentage of adherence to these measures, it is crucial for all members of the team to consistently perform this practice, as they provide secure communication among nursing staff and other healthcare professionals. Furthermore, it is important to recognize that good practices and quality care can go unnoticed if they are not accurately documented, potentially compromising the continuity of high-quality care<sup>(14)</sup>.

To sum up, it is clear that hospitalized children are susceptible to pressure injuries and require specialized care to prevent them. Given their frequent and continuous interaction with patients, the nursing team plays a crucial role in planning and implemen-

ting preventive measures to reduce the incidence of pressure injuries in the pediatric population.

The predominance of female professionals observed in the study aligns with findings from other studies conducted in the pediatric sector, where a similar pattern was observed. For instance, a survey conducted with nursing professionals in the pediatric field reported a sample composed entirely of female professionals<sup>(11)</sup>. This gender distribution is consistent with other studies that have consistently shown that over 90% of professionals in the nursing category are women<sup>(23-24)</sup>.

The age group of over 30 years was found to have a significant influence on the adequate performance of preventive measures for pressure injuries. Professionals within this age group demonstrated higher scores in terms of knowledge and attitude related to preventing pressure injuries, as supported by previous research<sup>(25)</sup>. However, contrasting findings from another study indicated no significant relationship between knowledge of pressure injuries and the variable of "age"<sup>(26)</sup>. It is possible that professionals in the over 30 age group possess emotional maturity, physical capabilities, and intellectual and behavioral skills that contribute to greater stability and capacity in providing care<sup>(11)</sup>.

Training courses have shown to significantly enhance the role of nursing in preventing pressure injuries. This was demonstrated in a study conducted in the Pediatric Intensive Care Unit, where nurses initially lacked awareness of the etiology, risk factors, timing, and assessment methods for pressure injuries. However, after implementing educational strategies, the weekly incidence rate of injuries decreased from 8% to 3%<sup>(17)</sup>.

Therefore, ongoing education needs to be recognized as an investment in health services to prevent and reduce errors and achieve high-quality care, without underestimating the importance of the working conditions in which professionals operate<sup>(27)</sup>. Exhaustive work situations are prevalent in the nur-

sing profession, leading to high levels of stress due to the demanding workload and limited autonomy in the work environment<sup>(28)</sup>. This reality poses significant harm to both professionals and healthcare service users, as exhausted caregivers, compromised in their physical and emotional health, are unable to fulfill their full potential and become more susceptible to errors in the healthcare setting, thereby compromising the quality of care provided<sup>(29)</sup>.

In light of these challenges, the need for investment in continuing education for nursing professionals in child care is evident, particularly regarding the causes of injuries, risk factors, prevention strategies, and means of reporting. It is also crucial to raise awareness among healthcare managers regarding the importance of implementing standardized prevention protocols in healthcare institutions. Furthermore, the availability of suitable risk assessment instruments for children is indispensable, as they can guide clinical practice and provide nurses with valuable support in developing care plans aimed at reducing the incidence of pressure injuries in pediatric patients.

## Study limitations

A limitation of this study was that the evaluation of nursing care in the prevention of pressure injuries was performed only on children hospitalized in open units, excluding those in intensive care. This made it impossible to evaluate nursing care in all areas of pediatric care in the hospitals studied.

Another limitation was the difficulty in approaching the professionals due to the routine and demand of each sector, which affected the estimated time for returning the instruments, constituting a possible measurement bias. We can also identify the choice of a non-probabilistic sampling method for convenience as a limitation. Additionally, the characteristics of this study type, such as the collection of data at a single moment, should be considered.



## Contributions to practice

The study's findings have enabled the assessment of the quality of nursing care in preventing pressure injuries among children hospitalized in open units. They have underscored the need for health institutions to implement strategies such as providing ongoing education for these professionals and ensuring the availability of essential material resources for proper patient skin care, including coverings and pressure redistribution surfaces. Taking such measures will enhance the quality of care provided, making it more effective in preventing pressure injuries and promoting the safety of the pediatric population. Furthermore, this research is expected to inspire further studies in the field of pediatric nursing, focusing on patient safety and the evaluation of care quality.

## Conclusion

The study revealed a prevailing deficiency in nursing care for preventing pressure injuries in pediatric patients. The quality of nursing care was found to be influenced by factors such as the background of nursing professionals, particularly their participation in patient safety improvement courses and their experience in the field. An association was also observed between age group and a higher likelihood of implementing preventive measures. These findings underscore the necessity for training and professional development in patient safety and pressure injury prevention within the pediatric context, in addition to a less stressful work environment.

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## Authors' contribution

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Analysis and/or interpretation of data: Ferreira MKM, Lima FET, Almeida PC.

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Final approval of the version to be published and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.: Ferreira MKM, Lima FET, Diógenes MS, Florencio SSG, Araújo PR, Almeida PC, Costa CO.

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