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The Effect of Practices by Caregiver Mothers of Children with Tracheostomies at Home on the Occurrence of Pressure Ulcers

Evde Trakeostomili Çocuğuna Bakım Veren Annelerin Uygulamalarının Basınç Yarası Oluşumuna Etkisi

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Abstract

Introduction: Children with tracheostomies who are bedridden at home are vulnerable to the risk of pressure ulcers. This study aimed to determine the practices made by mothers, who care for their children with tracheostomy at home, for pressure ulcers and identify the associated factors.

Methods: This cross-sectional descriptive study was designed with 190 mothers with a child with tracheostomy who met the inclusion criteria. A comprehensive, semi-structured questionnaire was used for data collection. Besides descriptive analyses, chi-square statistical test was used to test the relationship between variables.

Results: 60.5% of mothers with tracheostomy children lacked sufficient knowledge about how to prevent pressure ulcers. Pressure ulcers developed in tracheostomy children, mostly due to medical devices such as percutaneous endoscopic gastrostomies (36.8%) and tracheostomy tubes (33.2%). There was a significant correlation between caregiver mothers' knowledge about pressure ulcers, their practices (positioning the child, moisturising the skin, massaging, etc.), and the presence of pressure ulcers (p=0.000).

Conclusion: The risk of medical device-related pressure ulcers is high in children with tracheostomies who are dependent on medical technology at home. It is important for nurses and caregivers to identify risk factors for children with tracheostomies. Practical training programmes should be organised to improve caregivers' knowledge and practices to prevent pressure ulcers.

Keywords: Caregivers, medical devices, pediatric, pressure injuries, tracheostomy

Öz

Giriş: Evde yatağa bağımlı olan trakeostomili çocuklar basınç yaralanmaları riskine karşı savunmasızdır. Bu çalışma, evde trakeostomili çocuğuna bakım veren annelerin basınç yaralarına yönelik uygulamalarını belirlemeyi ve ilişkili faktörleri tespit etmeyi amaçladı.

Yöntemler: Bu kesitsel tanımlayıcı çalışma, dahil edilme kriterlerini karşılayan trakeostomili çocuğa sahip 190 anne ile gerçekleştirildi. Veri toplamak için kapsamlı, yarı yapılandırılmış bir anket kullanıldı. Tanımlayıcı analizlerin yanı sıra, değişkenler arasındaki ilişkiyi test etmek için ki-kare istatistiksel testi uygulandı.

Bulgular: Trakeostomili çocuğa sahip annelerin %60,5'i bası yaralarını önleme konusunda yeterli bilgiye sahip değildi. Trakeostomili çocuklarda bası yaraları çoğunlukla perkütan endoskopik gastrostomi (%36,8) ve trakeostomi tüpleri (%33,2) gibi tıbbi cihazlar nedeniyle gelişti. Bakım veren annelerin bası yaraları hakkındaki bilgileri, uygulamaları (çocuğun pozisyonlandırılması, cildin nemlendirilmesi, masaj yapılması vb.) ve bası yaralarının varlığı arasında anlamlı bir korelasyon bulundu (p=0,000).

Sonuç: Tıbbi teknolojiye bağımlı olarak evde bakım gören trakeostomili çocuklarda tıbbi cihazlara bağlı bası yarası riski yüksektir. Hemşireler ve bakım verenler için trakeostomili çocuklarda risk faktörlerini belirlemek büyük önem taşımaktadır. Bakım verenlerin bası yaralarını önlemeye yönelik bilgi ve uygulamalarını geliştirmek amacıyla eğitim programları düzenlenmelidir.

Anahtar Kelimeler: Bakım verici, tıbbi cihazlar, pediyatrik, basınç yarası, trakeostomi

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Introduction

Pressure ulcers have persisted as a major health concern when caring for children with medical complexities.[1,2] A pressure ulcer is defined as an injury localised to the skin or subcutaneous tissue caused by pressure, shear, and friction, usually over a bony prominence or associated with medical devices.[3,4] Pressure ulcers cause pain, prolonged recovery time, impaired quality of life, and raising the risk of infection and death.[5] It also leads to higher medical expenditures for patients and the healthcare system.[6]

Children who are critically ill and dependent on the use of medical technology represent a vulnerable group at high risk for pressure ulcers.[1,7] This group also includes children with tracheostomies who require ongoing home care and treatment. Due to advances in technology, mortality has significantly dropped with the use of medical devices in children with functional diversity, who are usually treated at home.[8,9] However, medical devices, such as tracheotomies, intravenous catheters, gastrostomies, colostomy bags, and urinary catheters, continue to be important sources of pressure for these children. Evidence suggests that medical devices are one of the leading causes of the development of pressure ulcers in the paediatric population.[10,11] Medical devices are an essential therapeutic component of life-sustaining treatment and an extremely important consideration, as they are associated with 50% of pressure ulcers in paediatric inpatients,[12] but are highly challenging to prevent.[11,13]

While the problem of pressure ulcers in adults continues to draw considerable attention, there are a limited number of studies on pressure ulcers in children. A retrospective study in the hospitalised paediatric population found that the prevalence of pressure ulcers was 2.25% in all patients and 6.04% in paediatric intensive care unit (PICU) patients; 21% of patients had pressure ulcers associated with medical devices.[14] In another study, medical device-related pressure ulcers (MDRPI) were observed at approximately 7% in the PICU.[15] In a similar study, pressure injuries caused by medical devices were detected in 26.5% of children in intensive care.[16] A meta-analysis study on the incidence and prevalence of MDRPI in paediatric patients revealed that these were moderate to high for hospital and medical device-associated pressure ulcers.[17] A review reported that skin lesions related to tracheostomy may develop in children with tracheostomy.[18] No study has been found to describe the incidence or prevalence of pressure ulcers in paediatric patients with medical complexity. Multicentred studies on paediatric patients in paediatric hospitals have reported a point prevalence of pressure ulcers ranging from 4% to 35%.[19,20] However, these studies do not allow us to estimate the point prevalence among paediatric patients with medical complexity.[1]

Children with tracheostomies continue to be cared for at home following their treatment in the hospital.[21,22] For optimal care of these children, it is essential to involve the family caregivers in maintaining care continuity and social support. This necessitates that nurses be more sensitive when training families. Parents who care for their children at home are trained on some issues, such as aspiration, follow-up, and care before discharge. However, it appears that parents are inadequately trained regarding pressure ulcers.[23-26] Family caregivers assume an important role in caring for children with tracheostomies and in preventing pressure ulcers. If caregivers know how to prevent pressure ulcers, they can help enhance the child's quality of life.[23,27]

Pressure ulcers in children with tracheostomies who are cared for at home have not been sufficiently studied and have been overlooked. However, it is highly important to understand the incidence, prevention, and control of pressure ulcers in these children for both patient safety and safe care interventions.[28] Therefore, caregivers should have adequate knowledge about the preventive practices for pressure ulcers.[29] Nurses should assess the knowledge and practices of caregivers about preventing pressure ulcers.[30] When the literature was reviewed, no similar studies were found that examined the practices of family caregivers of children with tracheostomies in Türkiye who are cared for at home to prevent pressure ulcers. This study was conducted to determine the practices employed by mothers who care for their children with tracheostomy at home, for pressure ulcers and identify the associated factors.

The research questions were determined as follows:

What are the most common sites of pressure ulcers in children with tracheostomies who are cared for at home?

What are the factors that affect the occurrence of pressure ulcers in children with tracheostomies who are cared for at home?

What are the practices of mothers, who care for their children with tracheostomies, to prevent and care for pressure ulcers?

Materials and Methods

Study Design

This descriptive and cross-sectional study was conducted between October 2023 and March 2024.

Sample

The population of the study consisted of mothers who cared for their children dependent on medical technology at home in Türkiye, and the purposive sampling method was utilised to select the mothers. Power analysis was carried out using G*Power (3.1.9.2) software to calculate the sample size in

the study.[31] Based on the percentage values of the methods, to be studied in the literature review, the total sample size was calculated as n=174 using the G*Power program at an effect size of 0.4, a power of 95%, and a margin of error of 0.05.[32] Given the challenges of time, cost, and missing data, the study was completed with 190 mothers. The inclusion criteria were determined as being a mother of a child with a tracheostomy who was dependent on medical technology, over 18 years of age, having cared for her child for at least six months, and voluntarily participating in the study. Mothers of children who were dependent on medical technology had secondary medical conditions like skin and dermatologic diseases, and had paid caregivers were excluded from the study.

Data Collection

The tool used to collect the data was a structured questionnaire developed by the researchers based on a comprehensive literature review.[25,33]

The questionnaire consisted of three parts. The first part included questions about the characteristics of children with tracheostomies, (age, gender, weight, height) and their mothers (age, educational background, place of residence, length of caregiving, status of receiving training on pressure ulcers). The second part included the type of medical device to which the child was attached, the type of feeding, and the sites of pressure ulcers. The last part included questions about practices to prevent pressure ulcers. The questionnaire was sent to six experts in the field and finalized based on their feedback.

The data were collected using a Google form on social media platforms (Instagram, WhatsApp) and via telephone. The researcher sent a research invitation for the study and informed mothers of children with tracheostomies about the study via the social media platform. The researcher sent an online questionnaire to mothers who had accepted the research invitation. It took approximately 15 minutes to complete the questionnaire. Mothers who refused to accept the research invitation, used no smartphones, and reported that they had no time, were excluded from the study.

Statistical Analysis

The SPSS 25.0 for Windows (Statistical Package for Social Sciences, IBM SPSS, Version 25.0., Armonk, NY: IBM Corp.) software was used to statistically analyse the data. In order to obtain statistical results, the Shao method was used to assess whether the data were normally distributed. The mean, standard deviation, and minimum and maximum values, were calculated in continuous data analysis. Numbers and percentages were calculated in categorical data analysis. The data were compared using chi-square.

Ethical Considerations

Before beginning the study, ethical approval was obtained from the Kilis 7 Aralık University's Ethics Committee, under the reference number 2023/18-10, date: 13.10.2023. The study was conducted in accordance with the principles of the Declaration of Helsinki. The researcher informed the mothers about the study, informing them that participation was voluntary. The mothers provided their consent to participate in the study.

Results

Table 1 shows that 55.3% of the children with tracheostomies were girl, and their mean age was 6.09±4.70 years. The children's mean body mass index was 18.08±5.08 kg/m^2. 56.8% of the children used a tracheostomy and mechanical ventilation, 21.6% used a tracheostomy and oxygen therapy, 15.3% used only tracheostomy, and 6.3% used a pulse oximetry probe.

The mean age of the mothers was 34.10±6.85 years; 45.3% of them graduated from secondary school. The majority of the mothers (66.8%) lived in the city centre. 50.5% of the mothers reported that their child with a tracheostomy had pressure ulcers (Table 1).

The mothers reported that their children with tracheostomy had pressure ulcers mostly on the sacrum (20.3%) and buttocks (15.6%), and least on the face (5.2%) and fingers (4.2%). Pressure ulcers were caused by a percutaneous endoscopic gastrostomy (PEG) in 36.8% of the children, by a tracheostomy in 33.2%, by a nasogastric catheter in 15.3%, and by a saturation probe in 18.4%. While 37.5% of the mothers applied Rif and creams, 20.8% applied herbal products, and 5.2% applied wound care products, in pressure ulcer dressings (Table 2).

Table 3 shows the distribution of care practices of the mothers of children with tracheostomies. It was found that 82.6% of the mothers did not receive training about pressure ulcers when they were discharged home from the hospital, 60.5% did not know how to prevent pressure ulcers, and 72.1% did not know how to care for pressure ulcers. 12.1% of the mothers were placing nylon or oilcloth under their children and 70.5% were not using air mattresses. The majority of the mothers (90%) ensured that the sheets under their children were smooth and their skin was neither damp nor wet. 88.4% of the mothers used a pillow while positioning their children, and the majority of them (87.4%) massaged their children. The mothers bathed their children every 7.95±6.49 days on average and positioned their children every 3.06±4.12 hours (Table 3).

Table 1. Socio-demographic characteristics of children with tracheostomy and their mothers (n=190)

Variables		n	%
Child's gender	Girl	105	55.3
	Boy	85	44.7
		Mean ± SD	**Min-max**
Child's age		6.09±4.70	1.00-18.00
Child's body weight		20.790±13.338	5.00-75.00
Child's height		103.19±27.51	53.0-188.0
Child's BMI		18.08±5.08	5.23-38.78
		n	**%**
Technological equipment	Tracheostomy + mechanic ventilation	108	56.8
	Tracheostomy + oxygen therapy	41	21.6
	Only tracheostomy	29	15.3
	Pulse oximetry probe	12	6.3
Nutrition	PEG	110	57.9
	Enteral	60	31.6
	Oral	20	10.5
		Mean ± SD	**Min-max**
Mother's age		34.10±6.85	20.0-50.0
		n	%
Educational level	Primary school	40	21.1
	Secondary school	86	45.3
	High school	29	15.3
	Bachelor's degree	35	18.4
Living place	Province	127	66.8
	Town	48	25.3
	Village	15	7.9
Pressure ulcer	Yes	96	50.5
	No	94	49.5

SD: Standard deviation, PEG: Percutaneous endoscopic gastrostomy, BMI: Body mass index

Table 4 shows the comparisons between maternal care practices and the presence of pressure ulcers. A significant difference was found among the status of receiving training on pressure ulcers during discharge (X^2: 5.872, p=0.015), having knowledge about how to care for pressure ulcers (X^2: 10.010, p=0.002), and having knowledge about how to prevent pressure ulcers and the occurrence of pressure ulcers (X^2:10.460, p=0.001).

A significant difference was found among laying nylon or oilcloth under the child (X^2: 13.893, p=0.001), using an air mattress (X^2: 6.014, p=0.014), massaging the child (X^2: 4.532, p=0.033), and moisturising the skin of the child (X^2: 6.362, p=0.012) and the occurrence of pressure ulcers (Table 4).

Besides the above findings in Table 4, no significant difference was found in the occurrence of pressure ulcer according to the mothers' attention to keeping the sheet under the child smooth, keeping the child's skin dry, and using a pillow while positioning the child (X^2: 0.655, 0.655, 0.256, p=0.721, 0.613).

According to Table 5, a statistically significant difference was found between the mean frequency of bathing their children and the occurrence of pressure ulcer, and between the mean frequency of positioning the child and the occurrence of pressure ulcer (t=2.096, 2.919; p=0.037, 0.004).

Discussion

Children with tracheostomies who are dependent on medical technology have a higher risk of developing pressure ulcers due to their reduced mobility. Pressure ulcers are an important health concern that affects morbidity and mortality in the paediatric population, increases the burden of caregivers, and leads to physical and psychological problems.[34]

Table 2. Some characteristics of pressure ulcers in children with pressure ulcers (n=190)

Features			n	%
Pressure ulcer area	Sacrum		20	20.3
	Buttock		14	15.6
	Back of head		12	12.5
	Back		10	10.3
	Ear		10	10.3
	Heel		8	8.1
	Neck		7	7.2
	Hand		6	6.3
	Face		5	5.2
	Fingers		4	4.2
Pressure ulcer associated with medical device	Nasogastric tube	Yes	29	15.3
		No	161	84.7
	PEG	Yes	70	36.8
		No	120	63.2
	Tracheostomy tube	Yes	63	33.2
		No	127	66.8
	Pulse oximetry probe	Yes	35	18.4
		No	155	81.6
Materials used in pressure sores	Rif and cream		36	37.5
	Herbal products		20	20.8
	Sterile water/physiological saline		13	13.6
	St. John's wort oil		12	12.5
	Batikon/alcohol		10	10.4
	Wound care product		5	5.2

PEG: Percutaneous endoscopic gastrostomy

Table 3. Mothers' practices regarding the care of children with tracheostomy

Practices		n	%
Receiving training on pressure ulcers during discharge from the hospital	Yes	33	17.4
	No	157	82.6
Knowledge on how to prevent pressure ulcers	Yes	75	39.5
	No	115	60.5
Knowledge on how to care for pressure ulcers	Yes	53	27.9
	No	137	72.1
Laying plastic/oilcloth under the child	Yes	23	12.1
	No	167	87.9
Use of an air mattress in the child's bed	Yes	56	29.5
	No	134	70.5
Paying attention to keep the sheet under the child's smooth	Yes	171	90.0
	No	19	10.0
Paying attention to keep the child's skin neither moist nor wet	Yes	171	90.0
	No	19	10.0
Using a pillow while positioning the child	Yes	168	88.4
	No	22	11.6
Massaging the child	Yes	166	87.4
	No	24	12.6
Moisturising the child's skin	Yes	147	77.4
	No	43	22.6
	Mean ± SD	**Min**	**Max**
Frequency of bathing the child (days)	7.95±6.49	1.00	45.00
Frequency of positioning the child (hours)	3.06±4.12	1.00	24.00

Table 4. Comparison of mothers' practices in the care of children with tracheostomy and pressure ulcers

Practices	Pressure ulcers					Test value
	Yes		No			
	n	%	n	%	X^2/p	
Receiving training on pressure ulcers during discharge from the hospital	Yes	23	69.7	10	30.3	**X^2: 5.872**
	No	73	46.5	84	53.5	p=0.015
Knowledge on how to prevent pressure ulcers	Yes	27	36.0	48	64.0	X^2:10.460
	No	69	60.0	46	40.0	p=0.001
Knowledge on how to care for pressure ulcers	Yes	17	32.1	36	67.9	X^2: 10.010
	No	79	57.7	58	42.3	**p=0.002**
Laying plastic/oilcloth under the child	Yes	20	87.0	3	13.0	X^2: 13.893
	No	76	45.5	91	54.5	**p=0.001**
Use of an air mattress in the child's bed	Yes	36	64.3	20	35.7	X^2: 6.014
	No	60	44.8	74	55.2	**p=0.014**
Paying attention to keep the sheet under the child's smooth	Yes	88	51.5	83	48.5	X^2: 0.655
	No	8	42.1	11	57.9	p=0.721
Paying attention to keep the child's skin neither moist nor wet	Yes	88	51.5	83	48.5	X^2: 0.655
	No	8	42.1	11	57.9	p=0.721
Using a pillow while positioning the child	Yes	86	51.2	82	48.8	X^2: 0.256
	No	10	50.5	12	49.5	p=0.613
Massaging the child	Yes	79	47.6	87	52.4	X^2: 4.532
	No	17	70.8	7	29.2	**p=0.033**
Moisturising the child's skin	Yes	67	45.6	80	54.4	X^2: 6.362
	No	29	67.4	14	32.6	**p=0.012**

Table 5. Comparison of mothers' practices in the care of children with tracheostomy and pressure ulcers

Practices	Pressure ulcers		Test value
	Yes	No	
	Mean ± SD	Mean ± SD	t/p
Frequency of bathing the child (days)	8.92±7.32	6.96±5.39	t=2.096/p=0.037
Frequency of positioning the child (hours)	3.91±5.51	2.19±1.41	t=2.919/p=0.004

SD: Standard deviation

This study evaluated the practices related to pressure ulcer prevention of mothers of children with tracheostomies at home and the related factors.

In the study, the mean age of children with tracheostomies was 6 years (1-18 years), and more than half of them were connected to a mechanical ventilator. The children were also dependent on assistive medical devices such as nasogastric catheters and PEG. These results are compatible with studies that examined the prevalence of pressure ulcers in children in the PICU.[14,15] More than three-quarters of the children in the present study were fed enterally. Similar studies revealed that bedridden children were usually fed enterally.[15,35,36] Malnutrition and being connected to more than two medical devices have been reported as factors leading to pressure ulcers.[37,38]

Although pressure ulcers most commonly develop on the sacrum and buttocks in bedridden adult patients, the occiput and ears in children under 3 years of age, and the sacral region and heels in children over 3 years of age are the sites most affected by pressure. At 6-10 years of age, the sites of pressure ulcers are similar to those in adults due to their body proportions.[39,40] The results of this study, showed that the sacrum (20.3%), buttocks (15.6%), and occiput (12.5%) were the sites most commonly affected by pressure ulcers in children with tracheostomy. The findings of this study are compatible with the literature indicating that the head is the anatomical region most frequently affected by pressure ulcers.[17,41] In the present study, the vulnerability of the sacrum and buttock regions to pressure ulcers in children may be due to a combination of factors related to the anatomy or

physiology of the region, as well as the needs and conditions of paediatric patients and the practices of caregivers. As children are attached to medical devices such as mechanical ventilators, mothers may be concerned about positioning their children differently in bed and therefore often prefer the supine position. The most important factor that affects the site of the pressure ulcer is the patient's lying position. Staying continuously in the same position in patients with mobility problems disrupts capillary circulation in that region and causes tissue hypoxia.[37] Therefore, it is necessary to change the position of immobilised patients under treatment with mechanical ventilation every two hours, at most, and to position them laterally in a fowler or semi-fowler position.[42] One of the important findings of the present study was that pressure ulcers were frequently caused by medical devices such as nasogastric catheters, PEG, tracheostomy tubes, and pulse oximetry probes. Başbakkal et al.[15], who examined pressure ulcers associated with medical devices in the PICU, reported that the most common pressure ulcers resulted from nasogastric tubes. Systematic and meta-analyses reviews showed that respiratory devices, tracheostomy tubes, ostomies, neck collars, and supportive/safety devices were the most common sources of pressure ulcers in critically ill patients.[17,43] The most problematic devices were found to be pulse oximeters, endotracheal tubes, neckties, and face masks,[11,28] and children connected to multiple medical devices were found to be more likely to develop MDRPI.[44] To prevent pressure ulcers associated with medical devices in children who are cared for at home, homecare providers should carefully assess the patient's risks of pressure ulcers, and family caregivers should be taught to practice preventive measures for the placement and repositioning of devices.[17]

The findings of the present study showed that more than three-quarters of the mothers did not have knowledge about how to prevent and care for pressure ulcers. Also, a great majority of the mothers (82.6%) indicated that they were not trained on pressure ulcers when they were discharged from the hospital. A study that investigated the practices of caregivers caring for chronic pressure ulcers at home showed that caregivers had insufficient knowledge on how to care for pressure ulcers.[33] Studies with caregivers of children with tracheostomies suggested that mothers felt inadequate when caring for and treating their children.[45-47] Results of the present study are compatible with the literature. The lack of sufficient knowledge about pressure ulcers in mothers may be attributed to several factors. First, the mothers had a low educational level and were not fully informed on how to prevent pressure ulcers. Furthermore, the lack of training on pressure ulcers by the formal caregivers during the hospitalisation period may have led to the mothers feeling inadequate in providing care.

The present study showed that the mothers of children with tracheostomies generally applied rifampicin and cream, herbal products (centaury oil), and sterile water or physiological saline solution to care for pressure ulcers. A study showed that a great majority of caregivers applied normal saline and herbal products such as centaury oil for pressure ulcers.[33] Results of the present study are compatible with the literature. Reports have indicated that the barrier creams and products used alone may not prevent pressure or shearing, but they can be used to protect the skin and avoid ulcers caused by pressure and moisture.[40]

Results of the current study revealed that mothers, on average, positioned their children every three hours to prevent pressure ulcers, and the majority used pillows while positioning. However, more than half of the children who were cared for at home had no air mattress. In their study, Arslan et al.,[35] found that 39.5% of the formal caregivers positioned patients under treatment in the PICU every 2 hours, and 35.5% positioned them every 3 hours. Although the frequency of positioning varies depending on the patient's condition, fewer pressure ulcers have been reported to develop with position changes every 2-4 hours.[35,48] Despite the low use of air mattresses in the present study, the use of static and alternative air mattresses has been reported to be effective in preventing pressure ulcers in the scientific literature.[49]

More than half of the mothers massaged their children, moisturised their skin, and bathed them once a week. Results of the present study showed a significant difference between the frequency of bathing or positioning children with tracheostomies and the occurrence of pressure ulcers. Bed baths keep bedridden patients clean and fresh. Traditional bed baths with soap and water alter skin acidity, resulting in skin damage.[50] Reportedly, dry skin may lead to infections and pressure ulcers.[51] Today, traditional bed baths have been replaced by disposable wet wipe bed baths. This technique has been reported to lower the risk of skin damage and pressure ulcers.[52]

The present study reported a significant difference in maternal educational level regarding pressure ulcer care. Previous studies have shown that training on how to prevent pressure ulcers is effective in raising the knowledge level of caregivers.[53,54] Results of the study are consistent with the literature. If planned training on pressure ulcers for caregivers is implemented, the risks of pressure ulcers in children with tracheostomies who are cared for at home can be lowered.

Study Limitations

The findings of the study were limited to mothers who were caring for their children with tracheostomies. In the evaluation of pressure ulcers in children with tracheostomies, the reports

by the mothers were taken into consideration. No scale was used to identify the pressure ulcers, and thus pressure ulcers could not be graded. However, the mothers who reported pressure ulcers in their children were interviewed by video call, and the site of the pressure ulcer was confirmed. For future research, multidisciplinary studies can be planned in larger sample groups, using pressure-sensitive scales. Future research can be planned as multidisciplinary studies using pressure sore scales in larger sample groups.

Contribution to Clinical Practice

Children with tracheostomies who are immobilized for long periods of time and dependent on multiple medical devices are more likely to experience MDRPI. This study showed the current occurrence of pressure ulcers in children with tracheostomies who were cared for at home within the Turkish population. This may increase the awareness of nurses and caregivers regarding pressure ulcers in children with tracheostomies. Knowing the risk factors for MDRPI in bedridden children with tracheostomies can help both nurses and caregivers recognise pressure ulcers earlier and take measures to protect patients from developing MDRPI.

Therefore, it is necessary to optimise the health and well-being of children and lessen the burden on caregivers through the collaboration of a multidisciplinary team that includes a comprehensive health service. Health professionals who provide home care services should follow up on children with tracheostomies to prevent pressure ulcers at home, and wound care nurses and paediatric nurses should plan and implement caregiver training. Consequently, parents who care for their children with tracheostomies should be empowered in their caregiving and guided based on the available evidence, including the best recognition and prevention strategies for pressure ulcers. Future studies are required to improve the skills of family caregivers accordingly.

Conclusion

Children who are bedridden at home are vulnerable pressure ulcers. This study suggested that children with tracheostomies who are cared for at home are at risk for pressure ulcers. Pressure ulcers developed most commonly in the sacral, hip, and head regions in children with tracheostomies. Children were connected to several devices that caused MDRPI. Mothers who were primary caregivers at home lacked sufficient knowledge and proficiency in how to prevent and manage pressure ulcers. Nurses should identify the risk factors for MDRPI and respond early to prevent pressure ulcers in children with tracheostomies.

Ethics

Ethics Committee Approval: Before beginning the study, ethical approval was obtained from the Kilis 7 Aralık University's Ethics Committee, under the reference number 2023/18-10, date: 13.10.2023. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Informed Consent: The researcher informed the mothers about the study, informing them that participation was voluntary. The mothers provided their consent to participate in the study.

Footnotes

Authorship Contributions

Concept: H.N.Ç.Ö., E.E., Design: E.E., Data Collection or Processing: H.N.Ç.Ö., E.E., Analysis or Interpretation: H.N.Ç.Ö., E.E., Literature Search: H.N.Ç.Ö., E.E., Writing: H.N.Ç.Ö., E.E.

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