Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

Wound Healing in Pediatric Patients with Chronic Skin Wounds: The Critical Role of Nutrition and Nursing Interventions

Faleh Mubarak Alshahrani[1], Madkhal Abdulezaz Alzubali[2], Amnah Saeed H. Alsammak[3], Muslat Khalaf Al Muteri[4], Jehan Abdullah Mohammad Alabyad[5], Emad Zaid Abutaleb[6], Bayan Mohammed Nakthan Alanazi[7], Azizah Ahmed Sofyani[8], Marzoqa Mashan Alshamri[9], Abdullah Ahmed Salami[10], Ali Mohammed Alhamdan[11], Ali Mohammed Hassani[12], Turki Abdulaziz Alabdulkarim[13], Badr Abdulrahman Abogoaeed[14], Ibrahim Mohammed Alsubait[15]

Abstract

Chronic skin wounds, particularly pressure injuries, pose significant challenges in pediatric patients, often resulting from immobility, malnutrition, and other complex health issues. Optimizing nutrition is crucial for promoting healing and maintaining skin integrity in this vulnerable population.This review analyzes existing literature on the role of nutritional interventions in the management of chronic skin wounds in pediatric patients. A systematic search was conducted using databases such as PubMed, CINAHL, and Embase, focusing on studies published from 2018 to 2023. Key parameters included macro and micronutrient requirements, assessment tools, and multidisciplinary approaches.The findings indicate that adequate nutritional support significantly enhances wound healing in pediatric patients with chronic skin wounds. Macronutrients, particularly protein, are essential for tissue repair, while micronutrients such as zinc and vitamin C play critical roles in immune function and collagen synthesis. The review highlights the importance of individualized nutritional assessments and the integration of registered dietitians in the care team to optimize nutritional strategies tailored to each child's needs.Implementing a structured nutritional management plan is vital for improving outcomes in pediatric patients with chronic skin wounds. Continuous monitoring and adjustment of nutritional intake can enhance healing processes, reduce complications, and improve overall health. Future research should focus on standardized protocols for nutritional interventions and further explore the impact of specific micronutrient supplementation in pediatric wound care.

Keywords: *Chronic Skin Wounds, Pediatric Nutrition, Pressure Injuries, Nutritional Interventions, Multidisciplinary Approach.*

Introduction

The skin is the biggest organ system, primarily functioning as a barrier that safeguards the body from outside microorganisms and harmful chemicals. Skin integrity and function need macro and micronutrients for cellular turnover to sustain homeostasis, facilitate new growth, and enable healing, particularly after damage or compromised integrity. Immobility, sickness, or injury, along with the potential for inadequate

[1] Ksa, Ministry of Health, Al-Mada General Hospital
[2] Ksa, Ministry of Health, Rabigh Disease Vector Control Center.
[3] Ksa, Ministry of Health, Imam Abdulrahman Bin Faisal University (Iau)
[4] Ksa, Ministry of Health, Naif General Hospital
[5] Ksa, Ministry of Health, Corporate Communication in The Madinah Health Cluster
[6] Ksa, Ministry of Health, King Salman Hospital
[7] Ksa, Ministry of Health, Hafar Albatin Centeral Hospital
[8] Ksa, Ministry of Health, Shubra Health Center
[9] Ksa, Ministry of Health, Maternity and Children's Hospital
[10] Ksa, Ministry of Health, King Saud Medical City
[11] Ksa, Ministry of Health, King Saud Medical City
[12] Ksa, Ministry of Health, King Saud Medical City
[13] Ksa, Ministry of Health, King Saud Medical City
[14] Ksa, Ministry of Health, King Saud Medical City
[15] Ksa, Ministry of Health, King Saud Medical City

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

nutrient intake, jeopardizes skin integrity, especially in hospitalized newborns and children, a demographic that poses distinct problems for nutritional treatment and optimum skin care. Nutrition treatment must not only meet the metabolic requirements of the present sickness, illness, or injury but also rectify any pre-existing malnutrition, mitigate any decline in nutritional status, and support growth milestones (1,2).

A prevalent breakdown of the epidermal barrier in children inpatients is the development of a pressure injury (PI). Pressure injuries (PI), characterized by localized damage to the skin or underlying tissue solely attributable to pressure or an array of pressure as well as skin shear, have an incidence in children estimated to vary from 10% to 27%, quantified as the number of PIs per 1,000 patient days (1-3). The prevalence of primary immunodeficiency (number of afflicted patients divided by the entire patient population at a certain period) in children is estimated to be as high as 43 percent (1). The frequency and incidence of pressure injuries (PI) in hospitalized patients are determined by their occurrence per patient days or per device days for medical device-related pressure injuries (MDRPI). In a trio of prevalence studies concerning hospital-acquired skin injury (HASI), Stellar et al. (2013) identify pressure injuries (PI) as the predominant kind of skin damage in pediatric patients (4). The causes of these injuries are immobility, multi-drug-resistant pressure injuries (MDRPI), diaper dermatitis, and epidermal stripping. Current research indicates that 1.4% of all newborns and children have a pressure injury during hospitalization (1,5).

Skin compromise may be classified into two primary categories: intrinsic factors and extrinsic triggers, both of which may lead to a pressure injury (PI). Intrinsic variables may include the underlying disease entity, such as autoimmune and genetic disorders, immunocompromised state, diseases necessitating surgical intervention, moisture-associated skin disturbance, and skin disintegration related to pharmacological or treatments. Extrinsic variables that lead to skin compromise include immobility, device-related damage, extravasation injuries, and medical adhesive-related skin injury (MARSI), sometimes referred to as epidermal stripping.

Skin compromise is an intrinsic risk of adverse events for children in the Pediatric Intensive Care Unit (PICU), where immobility, disease, and injury are prevalent, and adequate nutritional treatment often poses challenges. Point prevalence survey studies indicate that the incidence of pressure injuries (PI) in the pediatric intensive care unit (PICU) population ranges from 9% to 28% (6-8) and may reach up to 23% in newborns (9). Managing skin integrity in hospitalized pediatric patients requires a deliberate emphasis and collaborative multidisciplinary approach. Although appropriate nutrition therapy including macronutrients is crucial for wound healing and skin integrity preservation, the significance of micronutrient supplementation in the prevention and treatment of pressure injuries is less well established.

Recently released worldwide clinical practice recommendations have revealed inadequate nutritional status as a considerable risk factor for pressure injuries in adults (10). Although these rules do not explicitly pertain to babies and children, the authors deduce analogous assumptions for pediatric patients. There is a scarcity of knowledge about the role of micronutrients in the prevention of PI, as well as few guidelines on micronutrient supplementation treatment for the management of PI in hospitalized pediatric patients. This paper intends to review the existing literature on pressure injuries (PI) in critically ill children, identify optimal assessment tools for recognizing PICU patients at risk for PI, outline macro and micronutrient requirements for children in the PICU, and discuss a multidisciplinary strategy for the prevention, identification, and management of PI in critically ill pediatric patients.

1. Methods

We conducted a comprehensive study to delineate the significance of nutritional status and treatment in relation to protein insufficiency in hospitalized or seriously sick pediatric patients (11). A scoping study was conducted due to the scarcity of available research on this subject. The PubMed, Embase, and CINAHL archives were queried using keywords and index phrases pertaining to components and nutrients relevant to nutrition.

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

Estimated energy requirements should include the hypermetabolic condition of the hospitalized individual and the requirement for anabolic cellular regeneration to repair damaged tissue (12). Sufficient energy provision is essential to maintain a positive energy balance, facilitating protein usage for collagen as well as nitrogen synthesis instead of its catabolism for energy. When the body is deficient in carbohydrates and fats, the kidneys and liver resort to using protein from muscle breakdown to convert lean muscle mass into glucose (13). Consequently, there is a diminished availability of protein to facilitate the anabolic phase of wound healing. No published research currently specifies energy needs for pressure injury healing in critically unwell children; however, increased energy and protein intake has shown benefits for wound healing in adults (10,14,15).

Pre-existing malnutrition, including obesity, must be considered when assessing overall energy requirements. Protein-energy deficiency increases the risk of developing pressure injuries and hinders wound healing. Malnourished youngsters require a greater total calorie intake than the recommended levels for well-nourished children. A comprehensive nutritional evaluation by a registered dietitian (RD) is essential for assessing energy and protein requirements to facilitate catch-up development and wound healing (16). Ensuring prompt and adequate energy supply to children with PI is crucial; nevertheless, fast escalations in energy provision must be balanced against the potential dangers of electrolyte imbalances associated with refeeding syndrome (17).

Protein is essential for maintaining epidermal integrity, facilitating cell development and proliferation, and regulating fluid and electrolyte balance (18). The presence of a stage 1-3 pressure injury and/or deep tissue damage is believed to elevate protein requirements above the U.S. standard. Recommended Dietary Allowance (RDA) (10,19). Moreover, those with the most severe pressure injuries (stage 4) need the highest protein intake for recovery (20). Critically sick children generally have elevated protein requirements relative to healthy peers, and the existence of a protein insufficiency might further augment these demands. The pediatric critical care nutrition recommendations established by the American Society for Parenteral and Enteral Nutrition (ASPEN) and the Society of Critical Care Medicine (SCCM) do not endorse the use of the Recommended Dietary Allowance (RDA) for protein, since it often underrepresents the requirements of critically ill pediatric patients (21). When augmenting protein supply, it is essential to consider comorbidities that impact protein metabolism and use, such as acute renal damage and other organ dysfunctions.

Proper fat intake is essential to avoid vitamin deficits that may compromise skin integrity. Fat serves as the most concentrated energy source and may be retained as triglycerides in adipose tissue for future use. Proper provision of important fatty acids is crucial to avert micronutrient deficits that may compromise skin integrity (22). Indicators of essential fatty acid insufficiency involve xerosis, seborrheic dermatitis, and impaired wound healing (22-24). Dietary fat is essential for the absorption of fat-soluble vitamins K, D, E, and A. Fat should be at least 10−25% of total calorie consumption and must comprise important fatty acids, such as linolenic and linoleic acid, to prevent malnutrition.

Dehydration hinders oxygen transport to injured tissue. Stage 1–2 pressure ulcers often do not need increased fluid intake beyond maintenance levels. In adults, fluid requirements are elevated owing to heightened insensible losses from wound drainage (10). When using a wound drainage device, it is essential to account for losses from drainage output in the evaluation of fluid status. Managing the fluid requirements of critically sick children is crucial since these demands might significantly vary across individuals depending on their clinical condition. Preventing exacerbation of fluid overload is crucial since patients often need substantial volume resuscitation early in their ICU treatment, which might influence clinical outcomes (25).

Zinc is a crucial mineral that is vital to wound healing, cellular division, immunological response, and the production of DNA and RNA. The causality of zinc insufficiency may be diverse. Corbo et al. (26) established an etiological categorization scheme with five major categories: type I low intake, type II high losses, type III malabsorption, type IV increasing demand, and type V other (26). Zinc deficiency may present in several forms due to its diverse roles in the body's organ systems. Indicators of zinc deficiency

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

include stunting, changed taste and olfaction, decreased wound healing, and hypogonadism. The distinct cutaneous manifestations of zinc insufficiency include skin lesions (often crusted plaques in the perianal and perioral regions), baldness, and diarrhea (27). Zinc levels, when analyzed with a skin evaluation and medical history, assist in verifying a zinc deficit. Nonetheless, zinc concentrations may seem inaccurately low during periods of acute stress and inflammation (26). Consequently, clinical state must be taken into account when evaluating zinc levels, particularly in critical illness, and considerable wound drainage or gastrointestinal losses that may exacerbate zinc depletion should be closely monitored. Upon identification of zinc insufficiency, zinc supplementation should be started. Clinical remission often begins within days after the commencement of therapy (28). Prolonged oral zinc supplementation is inadvisable due to zinc's competition with copper absorption. This adversely affects copper levels, which might hinder wound healing as copper is an essential cofactor in collagen cross-linking (29). Zinc poisoning is uncommon; nonetheless, high consumption may lead to gastrointestinal discomfort (30).

Zinc has a crucial role in the process of wound healing. Research on adults indicates that zinc supplementation enhances wound healing only in those with inadequate levels. Pediatric studies are deficient. Consequently, regular zinc supplementation is not advised until a deficit is detected. The applicability of adult studies to the pediatric population regarding zinc supplementation in wound healing, especially in pressure injuries in children, remains ambiguous, necessitating more study for clarification (31,32).

Vitamin C is a water-soluble vitamin that serves as an antioxidant and a cofactor for several enzymes. It is essential for fatty acid transport, collagen synthesis, neurotransmitter production, prostaglandin metabolism, and nitric oxide (NO) synthesis (33). Risk factors for deficit in pediatric patients include developmental delay and autism (attributable to selective or restricted diets), iron excess, episodes of oxidative stress, and chemotherapy. Indicators of deficiency include inadequate wound healing, musculoskeletal and joint discomfort, tiredness, weakness, anorexia, edema, depression, neuropathy, and vasomotor instability. Scurvy is a result of vitamin C insufficiency and may emerge as perifollicular hemorrhage, petechiae, coiled hair, gingivitis, ecchymosis, mucosal bleeding, and anemia (33). Deficiency resulting from inadequate intake may manifest within three months; however, in severely unwell children, it may arise more rapidly owing to oxidative stress (34). No established therapy dosages for vitamin C are available for pediatric patients with wounds or pressure injuries. Vitamin C toxicity is uncommon; nonetheless, gastrointestinal disturbances and oxalate stones have been seen in people with renal disease (35).

Vitamin A is a lipophilic vitamin and a powerful antioxidant. Vitamin A is essential for several physiological activities, including bone health, gene transcription, cell and tissue development, mucous membrane integrity, collagen production, and immunological function (36). Vitamin A deficiency may lead to compromised skin integrity and hindered wound healing, increasing the risk of wound infections. No suggested dosage of Vitamin A for wound healing in pediatric patients exists. Vitamin A must be administered judiciously in patients with hepatic and/or renal dysfunction. Acute toxicity in humans with a single dose above 150,000 mcg has been shown to induce nausea, vomiting, headache, vertigo, impaired vision, and elevated intracranial pressure (37). Moreover, in babies, a bulging fontanel has been seen in cases of acute and chronic poisoning (38,39). Prolonged supplementation over 30,000 mcg in adults may result in chronic toxicity, manifesting as irritability, anorexia, skin desquamation, and biochemical liver abnormalities, including increased enzymes, fibrosis, and cirrhosis. Further atypical symptoms associated with vitamin A toxicity in newborns include hypercalcemia, hyperphosphatemia, and metastatic calcifications, which may arise with prolonged intakes of 5,500–6,750 mcg/d or above over a duration of 1–3 months (38). Consequently, prolonged supplementation of Vitamin A is generally not advised and must be constantly monitored via blood levels.

Iron is a mineral that is crucial for skin health, mucous membrane integrity, hair, and nails. Iron, in conjunction with vitamin C, is essential for collagen formation and is vital for the generation of red blood cells. Clinically, iron deficiency may manifest as pallor, angular cheilitis, koilonychia (spoon-shaped nails), frail nails, pruritus, and brittle hair. Pediatric patients aged 6 to 20 months are susceptible to iron deficiency anemia during the shift from iron-fortified formula to cow's milk. Furthermore, females have a heightened

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

risk of iron insufficiency due to iron losses associated with menstruation. An iron profile is often used to identify iron insufficiency. It is important to recognize that ferritin, part of the iron profile, functions as an acute phase reactant and is not a dependable indicator in critically sick patients.

Concerning skin structure and integrity, anemia caused by iron deficiency may adversely affect wound strength; however, this is not reliably shown in existing human investigations (40-42). Until now, these investigations have not established the impact of iron deficiency anemia on the phases of wound healing, and there is even less evidence about the interaction between iron and PI. No existing recommendations specify the optimal iron dose for wound repair in kids. Nevertheless, if an iron shortage exists, an iron-rich diet and/or iron supplements are necessary. To improve absorption, iron ought to be ingested orally with meals high in vitamin C.

Arginine is classified as a conditionally necessary amino acid, indicating that during periods of severe tension or trauma, the body cannot synthesize sufficient quantities of arginine to meet physiological requirements (43). Arginine is involved in collagen formation and has immune-modulating capabilities, both of which may facilitate wound healing. Research on adults examining oral nutrition supplements (ONS) fortified with arginine, zinc, as well as antioxidants has shown a beneficial enhancement in the healing rate (44,45). Supplementation with isolated arginine is not a conventional therapeutic practice, especially due to concerns over its propensity to induce excessive nitric oxide (NO) generation in critically sick patients, which may lead to adverse effects (46).

Proposed Nutritional Management for Children with Protein Intolerances

At now, there are no established practices or clinical standards for optimal nutritional management in pediatric patients with different stages of PIs. Furthermore, there are no established dietary risk evaluation screening techniques for critically unwell pediatric patients. Thompson et al. discuss nutritional strategies to enhance juvenile wound repair; yet they do not particularly focus on pressure injuries in critically unwell children (47). Thompson et al. (47) devised a clinical approach to enhance nutritional treatment for children with wounds. The authors included non-healing surgical cuts, dehisced surgical locations, pressure injuries graded 2–4, wounds necessitating vacuum-assisted closure components, and skin breakdown resulting from infections and nutritional inadequacies (47). The authors observed a heightened recognition of micronutrient deficits, particularly vitamin C and zinc, with enhanced monitoring of patients' nutritional status at their institution subsequent to the introduction of the clinical approach (47). The pipeline facilitated a uniform methodology across practitioners for administering nutritional treatment to patients with the aforementioned wounds.

The onset of adverse effects on skin integrity due to insufficient dietary intake remains ambiguous. Nevertheless, insufficient consumption of both macronutrients and micronutrients is associated with compromised wound healing (10). The heightened nutritional demands of juvenile patients, necessary for age-appropriate development, may be exacerbated by the presence of pressure injuries (PIs), necessitating adjustments in nutritional treatment to fulfill both fundamental metabolic needs and promote effective wound healing. This is especially difficult in hospitalized or severely sick children, who may have other clinical treatment objectives that may conflict with nutritional therapy.

The Role of the Nurse in Clinical Settings

Systematic and comprehensive skin evaluations start with the patient's nurse, are disseminated throughout all clinical team members, and are essential for the prevention and treatment of pressure injuries in pediatric patients (48-52). The prevention of pressure injuries (PIs) starts with a comprehensive evaluation of an individual and their skin health at admission, followed by regular assessments at specified intervals to detect injuries and properly assess the risk for acquiring a hospital-acquired PI (53). These examinations include comprehensive physical assessments, medical record reviews, and the identification and categorization of risk (53). Risk assessments are conducted with a frequency determined by unit requirements, patient history, acuity, mobility, and other factors related to the patient's state that may render them susceptible to a pressure injury (53). In the presence of concerns about skin integrity, a Skin Champion, a highly trained clinical

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

nurse, is called to assess the severity of the damage. The evaluation encompasses regions where a medical gadget maintains continuous touch with the skin. The objective of these evaluations is to determine areas that pose concerns for the growth of PI.

Upon identification of a wound or substantial skin damage, an authorized wound, ostomy, and continence nursing (CWOCN) expert integrates into the clinical team for a comprehensive examination and staging of the skin injury. The CWOCN expert subsequently provides further suggestions for wound care to the clinical team. This multidisciplinary approach, in conjunction with the medical care team, guarantees the involvement of the whole team, all dedicated to prioritizing the patient and/or family in care delivery (54,55).

Hospitalized babies and children are susceptible to pressure injuries and may exhibit both inherent and extrinsic variables that contribute to the development of wounds and skin integrity issues. Children with autoimmune and genetic dermatological disorders, immunodeficient conditions, necessitating surgical procedures, or receiving therapeutic interventions with a risk of skin deterioration possess inherent factors that elevate the risk for pressure injuries (PI). Extrinsic variables augment intrinsic factors, increasing the chance of skin injury or pressure injuries in an already physiologically impaired infant, hence complicating their treatment.

The nutritional state at the time of admission is considered to significantly influence hospitalized and critically sick pediatric patients and their risk for pressure injuries (56,57). Patients admitted with protein-energy deficiency have a considerable risk of delayed wound healing. Healing necessitates an appropriate nutritional condition, as wounds induce a catabolic state that markedly elevates nutritional requirements (15). When the body encounters the additional challenge of wound healing during starvation, it commences the degradation of its lean muscle mass for protein, thereby delaying the healing process (58,59). Nutrient deficiencies elevate the likelihood of developing a PI; hence, a dietary plan including essential supplements for at-risk patients should be implemented under the guidance of a registered dietitian (60,61).

The RD has distinct qualifications that enable them to be a vital component of the healthcare team. The proficiency of a registered dietitian to do a nutritional evaluation during the first 48 hours of PICU admission might facilitate the identification of nutritional deficiencies, inadequate nutritional status, and patients at heightened risk for pressure injuries early in their hospitalization (61). Nutrition evaluation involves identifying the patient's requirements and objectives for macronutrient and micronutrient supplements tailored to wound healing. Subsequent evaluations should be conducted weekly after admission to reassess the patient throughout their PICU stay (61). After a comprehensive evaluation, the RD may provide a suitable oral, enteral, parenteral, or combination regimen to achieve the patient's specified nutritional objectives.

The registered dietitian collaborates with the family, integrating home food preferences when suitable, to ensure the patient and family remain engaged and prioritized while formulating a nutrition therapy plan tailored to the patient's clinical condition and the method of nutritional delivery (10). The RD will collaborate with the clinical team to integrate any disruptions in nutrition delivery, therefore formulating a dependable and feasible feeding plan for implementation in both the hospital and home environments. Dietary modification is guided by the Registered Dietitian to address food allergies, cultural eating habits, dietary habits including vegetarianism, and medical conditions like diabetes, obesity, or kidney disease that necessitate a particular nutritional regimen to enhance established guidelines essential for wound healing. Furthermore, the clinical registered dietitian has expertise on the accessibility of commercially available protein as well as calorie modular supplements, or the capacity to formulate them using domestic items according to patient and family preferences. The RD may evaluate test results on vitamins and minerals and suggest supplementation and monitoring as necessary to improve wound healing (13,18).

If the oral route fails to satisfy the patient's elevated calorie and protein requirements as specified by the RD, additional tube feedings may be advised. This may be administered using an enteral tube of nutrition. The healthcare team may counsel the patient's family to explore semi-permanent enteral availability, including a percutaneous gastrostomy (PEG) tube, to provide sufficient nutritional intake if oral

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

consumption cannot be sustained to meet nutritional requirements and preserve skin integrity. The emergence of many or persistent pressure injuries heightens the risk of infection, arthritis, and osteomyelitis, potentially resulting in sepsis and mortality. Registered Dietitians offer the expertise to apply new study findings to clinical practice (20,22).

Conclusions

A significant deficiency exists in understanding and research about the impact of nutrition treatment on pressure injury recovery in pediatric patients. Hospitalized children, particularly those who are seriously unwell, have a heightened risk of pressure injury development. Inadequate nutritional status may hinder and postpone wound healing; thus, it is essential to monitor both macronutrient and micronutrient consumption. The nutritional status is crucial for wound repair, and children possess distinct requirements due to their heightened metabolic demands relative to adults. The recommended first suggestions for evaluating children with PI aim to provide sufficient nutritional treatment to enhance wound healing. Further study is essential to elucidate the impact of nutrition treatment and supplements in the prevention and healing of PI among hospitalized children.

References

Razmus I, Bergquist-Beringer S. Pressure Injury Prevalence and the Rate of Hospital-Acquired Pressure Injury Among Pediatric Patients in Acute Care. J Wound Ostomy Continence Nurs 2017;44:110-7.
Schindler CA, Mikhailov TA, Cashin SE, Malin S, Christensen M, Winters JM. Under pressure: preventing pressure ulcers in critically ill infants. J Spec Pediatr Nurs 2013;18:329-41.
Visscher M, King A, Nie AM, et al. A quality-improvement collaborative project to reduce pressure ulcers in PICUs. Pediatrics 2013;131:e1950-60.
Stellar, JJ. Hospital-acquired skin injury: Nurse led interventions to improve outcomes. In: Scientific and Clinical Abstracts From the WOCN(R) Society's 45th Annual Conference. Seattle, Washington, USA; 2013.
Curley MAQ, Hasbani NR, Quigley SM, et al. Predicting Pressure Injury Risk in Pediatric Patients: The Braden QD Scale. J Pediatr 2018;192:189-195.e2.
Kulik LA, Hasbani NR, Stellar JJ, et al. Hospital-Acquired Pressure Injuries in Children With Congenital Heart Disease: Prevalence and Associated Factors. Pediatr Crit Care Med 2019;20:1048-56.
Kottner J, Wilborn D, Dassen T. Frequency of pressure ulcers in the paediatric population: a literature review and new empirical data. Int J Nurs Stud 2010;47:1330-40.
Schlüer AB, Schols JM, Halfens RJ. Risk and associated factors of pressure ulcers in hospitalized children over 1 year of age. J Spec Pediatr Nurs 2014;19:80-9.
Baharestani MM, Ratliff CR. Pressure ulcers in neonates and children: an NPUAP white paper. Adv Skin Wound Care 2007;20:208, 210, 212, 214, 216, 218-20.
Munoz N, Posthauer ME, Cereda E, et al. The Role of Nutrition for Pressure Injury Prevention and Healing: The 2019 International Clinical Practice Guideline Recommendations. Adv Skin Wound Care 2020;33:123-36.
Peters MDJ, Marnie C, Tricco AC, et al. Updated methodological guidance for the conduct of scoping reviews. JBI Evid Synth 2020;18:2119-26.
Molnar JA, Underdown MJ, Clark WA. Nutrition and Chronic Wounds. Adv Wound Care (New Rochelle) 2014;3:663-81.
Tappenden K. Intake: digestion, absorption, transportation, and excretion of nutrients. In: Krause's Food & the Nutrition Care Process. 14th edition. St. Louis, Missouri: Elsevier, 2017:2-16.
Cereda E, Klersy C, Rondanelli M, et al. Energy balance in patients with pressure ulcers: a systematic review and meta-analysis of observational studies. J Am Diet Assoc 2011;111:1868-76.
Demling RH. Nutrition, anabolism, and the wound healing process: an overview. Eplasty 2009;9:e9.
Becker P, Carney LN, Corkins MR, et al. Consensus statement of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition: indicators recommended for the identification and documentation of pediatric malnutrition (undernutrition). Nutr Clin Pract 2015;30:147-61.
Pulcini CD, Zettle S, Srinath A. Refeeding Syndrome. Pediatr Rev 2016;37:516-23.
Breslow RA, Hallfrisch J, Guy DG, et al. The importance of dietary protein in healing pressure ulcers. J Am Geriatr Soc 1993;41:357-62.
Nieman Carney L, Blair J. Assessment of Nutrition Status by Age and Determining Nutrient Needs. In: The ASPEN Pediatric Nutrition Support Core Curriculum. Maryland: American Society for Parenteral and Enteral Nutrition; 2010:409-13.
Lee SK, Posthauer ME, Dorner B, et al. Pressure ulcer healing with a concentrated, fortified, collagen protein hydrolysate supplement: a randomized controlled trial. Adv Skin Wound Care 2006;19:92-6.
Mehta NM, Skillman HE, Irving SY, et al. Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Pediatric Critically Ill Patient: Society of Critical Care Medicine and American Society for Parenteral and Enteral Nutrition. JPEN J Parenter Enteral Nutr 2017;41:706-42.
Jeppesen PB, Christensen MS, Høy CE, et al. Essential fatty acid deficiency in patients with severe fat malabsorption. Am J Clin Nutr 1997;65:837-43.

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

Piper CM, Carroll PB, Dunn FL. Diet-induced essential fatty acid deficiency in ambulatory patient with type I diabetes mellitus. Diabetes Care 1986;9:291-3.
Mordarski B, Wolff J. Nutrition Focused Physical Exam Pocket Guide. Chicago: Academy of Nutrition and Dietetics; 2015.
Tuerk MJ, Fazel N. Zinc deficiency. Curr Opin Gastroenterol 2009;25:136-43.
Corbo MD, Lam J. Zinc deficiency and its management in the pediatric population: a literature review and proposed etiologic classification. J Am Acad Dermatol 2013;69:616-624.e1.
Lekwuttikarn R, Teng JMC. Cutaneous manifestations of nutritional deficiency. Curr Opin Pediatr 2018;30:505-13.
Jen M, Yan AC. Syndromes associated with nutritional deficiency and excess. Clin Dermatol 2010;28:669-85. 10.1016/j.clindermatol.2010.03.029 [DOI] [PubMed] [Google Scholar]
29.Williams JZ, Barbul A. Nutrition and wound healing. Surg Clin North Am 2003;83:571-96.
Yanagisawa H. Zinc deficiency and clinical practice. JMAJ 2004;47:359-64.
Ayello EA, Thomas DR, Litchford MA. Nutritional aspects of wound healing. Home Healthc Nurse. 1999;17(11):719-29; quiz 730.
Scholl D, Langkamp-Henken B. Nutrient recommendations for wound healing. J Intraven Nurs 2001;24:124-32.
Winston K, Christie J., Saba M. et al. Water-Soluble Essential Micronutrients. Maryland. In: ASPEN Pediatric Nutrition Support Core Curriculum. Maryland: American Society for Parenteral and Enteral Nutrition; 2010:56-73.
Dao DT, Anez-Bustillos L, Cho BS, et al. Assessment of Micronutrient Status in Critically Ill Children: Challenges and Opportunities. Nutrients 2017;9:1185.
Fukushima R, Yamazaki E. Vitamin C requirement in surgical patients. Curr Opin Clin Nutr Metab Care 2010;13:669-76.
Zinder R, Cooley R, Vlad LG, et al. Vitamin A and Wound Healing. Nutr Clin Pract 2019;34:839-49.
Bendich A, Langseth L. Safety of vitamin A. Am J Clin Nutr 1989;49:358-71.
Persson B, Tunell R, Ekengren K. Chronic Vitamin A Intoxication During the First Half Year of Life; Description Of 5 Cases. Acta Paediatr Scand 1965;54:49-60.
Olson JA. Adverse effects of large doses of vitamin A and retinoids. Semin Oncol 1983;10:290-3.
Jonsson K, Jensen JA, Goodson WH, 3rd, et al. Tissue oxygenation, anemia, and perfusion in relation to wound healing in surgical patients. Ann Surg 1991;214:605-13.
Pavlidis TE, Galatianos IN, Papaziogas BT, et al. Complete dehiscence of the abdominal wound and incriminating factors. Eur J Surg 2001;167:351-4; discussion 355.
Agarwal V, Sachdev A, Singh R, et al. Autoimmune hemolytic anemia associated with benign ovarian cyst: a case report and review of literature. Indian J Med Sci 2003;57:504-6. [PubMed] [Google Scholar]
43.Zhou M, Martindale RG. Arginine in the critical care setting. J Nutr 2007;137:1687S-92S.
Banks MD, Ross LJ, Webster J, et al. Pressure ulcer healing with an intensive nutrition intervention in an acute setting: a pilot randomised controlled trial. J Wound Care 2016;25:384-92.
Neyens JCL, Cereda E, Meijer EP, et al. Arginine-enriched oral nutritional supplementation in the treatment of pressure ulcers: A literature review. Wound Med 2017;16:46-51.
Thompson C, Fuhrman MP. Nutrients and wound healing: still searching for the magic bullet. Nutr Clin Pract 2005;20:331-47.
Thompson KL, Leu MG, Drummond KL, et al. Nutrition Interventions to Optimize Pediatric Wound Healing: An Evidence-Based Clinical Pathway. Nutr Clin Pract 2014;29:473-82.
ASPEN NUTRITION SCIENCE & PRACTICE CONFERENCE : March 28-31, 2020, Tampa, Florida: Vars Candidates, Trainee Awards, Best of ASPEN (Topic Awards), International Awards, Abstracts of Distinction, Posters of Distinction and Other Abstracts. JPEN J Parenter Enteral Nutr 2020;44:382. Erratum in: JPEN J Parenter Enteral Nutr 2021;45:215.
Multivitamin products. In: Lexi-drugs online. Hudson (OH): Lexicomp Inc.: 2021.
Ascorbic acid. In: Lexi-drugs online. Hudson (OH): Lexicomp Inc.: 2021.
Zinc gluconate. In: Lexi-drugs online. Hudson (OH): Lexicomp Inc.: 2021.
Dietary Reference Intakes: Applications in Dietary Assessment . Washington, D.C.: National Academies Press; 2000.
Chamblee TB, Pasek TA, Caillouette CN, et al. CE: How to Predict Pediatric Pressure Injury Risk with the Braden QD Scale. Am J Nurs 2018;118:34-43.
Edsberg LE, Black JM, Goldberg M, et al. Revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System: Revised Pressure Injury Staging System. J Wound Ostomy Continence Nurs 2016;43:585-97.
Braden B, Bergstrom N. A conceptual schema for the study of the etiology of pressure sores. Rehabil Nurs 1987;12:8-12.
Shields A, Lin JH. Risk Factors Associated With Pressure Injury in Critically Ill Children With Congenital Heart Disease. American Journal of Critical Care. 2023;32(3):216-20..
Stellar J. Hospital-acquired pressure injury in pediatrics: patterns and characteristics of injuries over a 6-year period. In: Scientific and Clinical Abstracts From the WOCN® Society's 49th Annual Conference: Salt Lake City, Utah May 19-23, 2017. 2017. p. S1-72.
Miske LJ, Stetzer M, Garcia M, et al. Airways and Injuries: Protecting Our Pediatric Patients from Respiratory Device-Related Pressure Injuries. Crit Care Nurs Clin North Am 2017;29:187-204.
Şimşek E, Demir AS, Semerci R, Karadağ A. The incidence and prevalence of medical device-related pressure injuries in pediatric patients: systematic review and meta-analysis. Journal of Pediatric Nursing. 2023;72:e130-8.
Boyar V. Outcomes of a Quality Improvement Program to Reduce Hospital-acquired Pressure Ulcers in Pediatric Patients. Ostomy Wound Manage 2018;64:22-8.
Boylan C. Paediatric pressure injuries: considerations for this patient cohort. Wound Practice and Research 2020;28:84-9.

التئام الجروح لدى المرضى الأطفال الذين يعانون من جروح جلدية مزمنة: الدور الحاسم للتغذية والتدخلات التمريضية

Journal of Ecohumanism
2024
Volume: 3, No: 8, pp. 12782 – 12790
ISSN: 2752-6798 (Print) | ISSN 2752-6801 (Online)
https://ecohumanism.co.uk/joe/ecohumanism
DOI: https://doi.org/10.62754/joe.v3i8.6072

الملخص

الخلفية :تُعد الجروح الجلدية المزمنة، وخاصة إصابات الضغط، تحديات كبيرة لدى المرضى الأطفال، وغالبًا ما تكون نتيجة لعدم الحركة، وسوء التغذية، وقضايا صحية معقدة أخرى. يُعد تحسين التغذية أمرًا بالغ الأهمية لتعزيز عملية التئام الجروح والحفاظ على سلامة الجلد في هذه الفئة الضعيفة.

الطرق :تحلل هذه المراجعة الأدبيات الحالية حول دور التدخلات التغذوية في إدارة الجروح الجلدية المزمنة لدى المرضى الأطفال. تم إجراء بحث منهجي باستخدام قواعد بيانات مثل PubMed و CINAHLوEmbase، مع التركيز على الدراسات المنشورة بين عامي 2018 و2023. شملت المعايير الرئيسية متطلبات المغذيات الكبيرة والصغيرة، وأدوات التقييم، والنهج متعدد التخصصات.

النتائج :تشير النتائج إلى أن الدعم التغذوي الكافي يعزز بشكل كبير من التئام الجروح لدى الأطفال الذين يعانون من جروح جلدية مزمنة. تُعد المغذيات الكبيرة، وخاصة البروتين، أساسية لإصلاح الأنسجة، بينما تلعب المغذيات الدقيقة مثل الزنك وفيتامين C أدوارًا حيوية في وظيفة الجهاز المناعي وتكوين الكولاجين. تؤكد المراجعة على أهمية التقييمات التغذوية الفردية ودمج اختصاصيي التغذية المسجلين ضمن فريق الرعاية لتطوير استراتيجيات تغذوية مخصصة تلبي احتياجات كل طفل.

الخلاصة :يُعد تنفيذ خطة إدارة تغذوية منظمة أمرًا ضروريًا لتحسين النتائج لدى المرضى الأطفال الذين يعانون من جروح جلدية مزمنة. يمكن أن يؤدي الرصد المستمر والتعديل المنتظم لمدخول التغذية إلى تعزيز عمليات الشفاء، وتقليل المضاعفات، وتحسين الصحة العامة. ينبغي أن تركز الأبحاث المستقبلية على تطوير بروتوكولات موحدة للتدخلات التغذوية واستكشاف تأثير مكملات المغذيات الدقيقة المحددة في رعاية جروح الأطفال.

الكلمات المفتاحية :الجروح الجلدية المزمنة، تغذية الأطفال، إصابات الضغط، التدخلات التغذوية، النهج متعدد التخصصات.