Reference	Study design	Population	Intervention	Outcome	Results
Gözen D et al. (2014)	RCT	63 newborns with diaper dermatitis (30 HBM, 33 barrier cream), Istanbul University NICU.	At each diaper change for ≤5 days: mother's breast milk vs 40% zinc oxide + cod liver oil cream	Diaper dermatitis severity score; time to clinical improvement	Barrier cream led to more improvement (93.6% vs 60%) and lower final scores; time to improvement similar between groups.
Kanti V et al. (2014)	RCT	22 preterm infants, 1,500–2,500 g, <37 weeks GA, ≤48 h after birth (11 SSO, 11 control)	Refined sunflower seed oil to whole body every 3–4 h for first 10 days vs no oil; both groups standard skin/diaper care	Primary: TEWL. Secondary: SCH, skin pH, sebum, NSCS, microbiological colonization/diaper dermatitis	With SSO, TEWL increased on abdomen/leg/buttock until day 11 then decreased; abdominal SCH fell vs stable in controls; pH and sebum similar; NSCS, diaper dermatitis and colonization similar. Authors conclude SSO may retard postnatal skin barrier maturation in preterm infants
Amare Y et al. (2015)	Qualitative study	Mothers, grandmothers, fathers, health workers, birth attendants, emollient sellers of infants <1 year in selected communities	None (description of existing neonatal skin care/emollient and massage practices)	Reported and observed types, timing, reasons, and patterns of emollient use and associated massage	Emollient use was near-universal and culturally rooted; products varied widely (e.g. butter, shea butter, coconut/cooking oils, baby oils/lotions, mentholated balms, engine oil) with frequent, sometimes vigorous massage; reasons included skin appearance, warmth, strengthening/joint shaping, growth and sleep. Some commonly used products were potentially harmful or counterfeit; authors call for context-specific emollient trials and behavior change
Coelho Timbó C et al. (2015)	Quantitative, descriptive and exploratory study	27 preterm infants hospitalized in a public NICU in Fortaleza	None	Type, location, size of skin lesions; associated diagnoses and treatments used	39 lesions: bruises 31%, diaper dermatitis 22%, hyperemia with edema 13%, abrasions 10%, erythema 5%, candidiasis 5%, hematomas 5%, others 3%; 44% on upper limbs; 50% <1 cm^2;

					topical meds used in 54%, observation only in 22%
Sacks E et al. (2015)	Qualitative study	Recently-delivered women, trained/untrained TBAs, traditional healers/elders (total ≈75 participants)	None; exploration of routine newborn skin, thermal and cord care practices	Descriptions of practices (bathing, warmth, emollients, cord applications) and perceived beliefs/risks	Newborns generally kept warm (hats, layers), but harmful customs common: cold-water bathing at night/after cord separation and widespread use of powders, ash, dung, oils and breastmilk on skin/cord, potentially increasing infection/hypothermia; authors recommend behavior-change and promotion of chlorhexidine cord care
Nangia S et al. (2015)	Two-arm randomized controlled clinical trial	74 preterm VLBW infants (birthweight 751–1499 g), randomized 37 coconut oil vs 37 control, enrolled at ~12 h of life	Oil group: 4 ml coconut oil applied to trunk twice daily from 12±6 h to day 7, no massage; Control: standard care, no oil	Primary: TEWL (evaporimeter) every 12 h to day 7. Secondary: skin condition score (Lane & Drost) and day-7 skin swab colonization	Coconut oil significantly reduced TEWL (mean difference −6.8 g/m²/h; $p<0.01$), yielded better skin scores, and fewer positive skin cultures (≈20% vs 60% in controls)

Reference	Design	Population	Intervention	Outcome	Results

Brogan J et al. (2017)	Quasi-experimental study	Newborns in a U.S. military medical center: sponge-bath cohort 2014–2015 (n=142) vs delayed immersion cohort 2015–2016 (n=140); parent survey n=36	Change from staff sponge bath at 2–4 h to parent-performed immersion bath ≥24 h of life	Neonatal temperature category (normothermic ≥97.7°F vs hypothermic), breastfeeding rates, parent satisfaction/confidence	Hypothermia reduced (30%→19%; p=.044); breastfeeding unchanged (~93–94% any, 75–76% exclusive); parents reported high satisfaction and improved confidence with bathing
Amer M et al. (2017)	RCT	70 healthy full-term neonates (1–7 days old), Egypt; 35 care (A), 35 no care (B)	Group A: structured skin-care regimen (bathing with baby shampoo/wipes, mineral oil, chlorhexidine cord care, frequent nappy changes, zinc oxide+olive oil barrier cream, education); Group B: no regimen	Weekly erythema, dryness, infection, neonatal skin diseases (esp. diaper rash), and time to rash improvement	Care group had less erythema/infection (weeks 3–4), far fewer diaper rashes (11.4% vs 57.1%), and faster rash resolution (all 3–5 days vs many ≥7–14 days; p=0.018); dryness and benign transient dermatoses similar
Khalifian S et al. (2017)	Survey	33 units invited, 30 responded (≈2076 newborns/year; NICUs excluded)	None (self-reported policies on bathing, vernix, emollients, diaper and cord care, protocols, infections)	Unit-level skin/cord care practices and presence of protocols; reported skin infections	Marked practice variability and frequent non–evidence-based care: 80% first bath <6 h; 73% no routine emollients; 63% no routine diaper products; 77% no cord antiseptic; 93% no skin-care protocol; very few reported infections
Lee JC et al. (2018)	RCT	32 preterm infants <37 weeks GA, clinically stable, randomized: 16 to bathing every 2 days, 16 every 4 days	Standardized nurse-performed sponge bath with sterile water and gauze: every 48 h vs every 96 h throughout NICU stay	Neonatal Skin Condition Score (NSCS) daily; axillary bacterial cultures at baseline and every 8 days	Four-day bathing was non-inferior for skin condition (difference 0.065; upper one-sided 97.5% CI 0.196 < 0.3) and showed no increase in axillary bacterial colonization (positive cultures 23.3% vs 25.9%; p>0.05). Authors conclude bathing interval can safely be extended to every 4 days

Yonezawa K et al. (2018)	RCT	227 healthy infants ≥35 w GA, 1–3 days old (113 intervention, 114 control; 202 evaluated at 3 months), Japan	Intervention: bath every 2 days + moisturizer ≥1×/day Control: daily bath, no routine moisturizer	Skin barrier at 3 months (TEWL, SCH, pH, sebum, face/body); incidence of dry skin and diaper dermatitis	Intervention group had lower face TEWL, higher SCH (face/body), less dry skin (face 22.9% vs 42.5%; body 25.0% vs 41.5%) and less diaper dermatitis in the first month (6.3% vs 15.9%)

Reference	Design	Population	Intervention	Outcome	Results
Smith HA et al. (2019)	Prospective cohort study	77 PICU admissions (children from birth, any GA/weight); 54.5% male	No clinical intervention; Braden Q risk assessment each shift and PU staging with EPUAP tool; findings used to adapt an SSKIN-based PU prevention care bundle	Incidence, grade and anatomical site of PUs; Braden Q risk category and individual risk factors	PU incidence 11.7% (9/77), all in males; 8/9 grade 1, 7/9 on face/scalp and all with airway support; main associated factor was low physical activity, while no child classified as high/severe Braden Q risk developed a PU
Gözen D et al. (2019)	RCT	73 healthy term newborns (GA ≥37 weeks, weight ≥2500 g, Apgar 1'/5' ≥7), randomized to bath at 24 h (n=39) or 48 h (n=34) in an Istanbul university hospital	Standardized tub bath under identical environmental conditions at either 24 h or 48 h after birth; all infants dried, re-wrapped, and capped; no other skin-care differences	Body temperature and skin moisture (forehead, abdomen, forearm, upper leg) measured pre-bath, immediately post-bath, and 10 min post-bath; comparison of changes between groups	Bath at 48 h led to smaller temperature drop (pre–post 0.30 vs 0.47 °C; Δpre–10 min 0.02 vs 0.18 °C; $p<0.001$) and higher mean skin moisture at 10 min (25.5% vs 24.3%; $p=0.044$) compared with 24 h bathing
Delgado BS et al. (2019)	Descriptive exploratory qualitative study	13 nurses from 13 Kangaroo-Mother Care reference neonatal units in multiple Brazilian states	None; open and closed questions on neonatal skin care routines (bath/diaper, device fixation, phototherapy)	Described strategies and protocols used for prevention and management of newborn skin lesions	Four strategy categories identified; nurses reported avoiding aggressive adhesives, using barrier products (e.g. hydrocolloid, oils), individualized bath/diaper routines, and specific precautions with devices and phototherapy, showing high concern and preparedness to protect newborn skin
Simsic JM et al. (2019)	Quasi-experimental quality-improvement	All patients in a 20-bed pediatric cardiothoracic ICU (~600 admissions/year)	Multicomponent PU-prevention bundle + weekly skin rounds, huddles, unit workgroup, caregiver input	Pressure ulcers > stage II per 1,000 patient-days; immobility- vs device-related PUs	PU > stage II rate fell from 15.7→2.9/1,000 patient-days and stayed low; immobility-related PUs 35→4, device-related 34→15; only one stage III PU in last 3 years

Cummins KA et al. (2019)	Quality-improvement study	All patients admitted to a 36-bed PICU in a Midwestern children's hospital (May 7–Jun 30, 2017); 51 nurses completed the pre-test, 29 the post-test	Nurse education on pediatric pressure injury risk/causation, reinforcement of turning every 2 h, and EMR trigger to auto-order nutrition consults for Braden Q ≤16	Primary: PICU pressure injury incidence (% of admissions). Secondary: turning compliance, nutrition consultation ordering for high-risk patients, nurse knowledge scores	Pressure injury incidence fell from 8% to 3%; overall turning compliance rose 47%→63% (high-risk 36%→67%); nutrition consult ordering for Braden Q ≤16 increased 9%→100%; nurse knowledge scores improved 61.6%→79.5%
Schachner L et al. (2020)	Expert consensus paper based on systematic literature review + modified Delphi panel	Consensus statement	Structured review (2010–2020) and panel meeting to draft and vote on skincare statements	Consensus statements on neonatal/infant skin, ceramides, and cleanser/moisturizer recommendations	Eight statements (≥83% agreement): infant skin is fragile with immature barrier; ceramides are key barrier lipids; skincare should be safe, fragrance/sensitizer-free; mildly acidic cleansers preferred; daily humectant + ceramide moisturizers help maintain barrier, reduce AD flares and may help prevent AD when started early

Reference	Design	Population	Intervention	Outcome	Results
Lund C et al. (2020)	RCT	100 healthy full-term newborns (≈39 weeks GA; 49 cleanser, 51 water; 50 vaginal, 50 C/S)	First immersion bath soon after birth: warm water alone vs warm water + mild soap-free liquid baby cleanser (Johnson & Johnson Head-to-Toe)	Primary: change in skin surface pH. Secondary: change in TEWL and stratum corneum hydration (SCH) at volar forearm and sternum, pre- vs post-bath	Skin pH, TEWL, and SCH all decreased significantly after the first bath, indicating barrier maturation; no significant differences in these changes between water vs cleanser groups, though TEWL and SCH were higher on the forearm than sternum
Ahn YM et al. (2020)	Quasi-experimental study	46 neonatal nurses from newborn units/NICUs in three metropolitan hospitals in Korea (23 intervention, 23 control)	Practice booklet *Practice Guideline for Improving Neonatal Skin Integrity* + single 30-minute lecture (15 min physiology, 15 min practice) for intervention group	Knowledge of neonatal skin care (35-item test) and self-rated confidence in skin care (0–10 VAS), pre and 2 weeks post	Knowledge scores increased significantly after training (≈20→27; p<.001); confidence scores rose slightly (≈5.6→6.4) but not significantly
Uysal G et al. (2020)	Pre–post intervention study with retrospective control group and prospective intervention group	Children 0–18 years in a 6-bed PICU, Istanbul: 181 controls (2014) and 165 intervention patients (2015), all LOS ≥48 h and without PI at admission	Evidence-based Pressure Injury Prevention Guide (daily Braden Q risk assessment, skin checks each shift, q2h repositioning with protectors, moisturizers/barrier products, nutrition monitoring) vs usual care	Incidence and timing of pressure injuries during PICU stay; Braden Q risk scores at admission and discharge	PI incidence decreased from 9.4% (17/181) to 3.6% (6/165; p=.033); in the intervention group PIs occurred later (mean 13.75±4.89 days) and Braden Q scores improved from 12.20±2.28 to 13.73±3.31 (p<.001)
Bargos-Munárriz M et al. (2020)	Quasi-experimental study	110 PICU patients ≤14 years at risk of PI and hospitalized >48 h (50 control, 60 intervention), Málaga, Spain	Standardized PI-prevention bundle (frequent skin checks, HOFA + barrier creams, repositioning, HOB	Incidence, number, days, site and stage of positioning-related PIs; bundle compliance	PI incidence fell 16%→13.3% (≥28 d stay: 55.6%→20%); PI count 14→11; PI days 212→70; stage III–IV PIs dropped to 0 in intervention group

			≤30°, pressure-redistributing surfaces, localized relief)		
Caglar S et al. (2020)	RCT	90 preterm infants, 32–37 weeks' GA, ≤48 h old, NICU in Turkey (30 SSO, 30 AO, 30 control)	SSO or AO 4 mL/kg to whole body (except head/face) 4×/day for 5 days vs standard care without oil	Stratum corneum hydration (skin moisture meter) and Neonatal Skin Condition Score (dryness, erythema, breakdown) pre- and post-5 days	Post-intervention, hydration significantly higher and NSCS significantly better in both SSO and AO groups vs control; no difference between SSO and AO; no harmful skin effects observed
Rogers S et al. (2021)	Quality improvement study	1070 NICU infants >1 day (291 pre, 779 post) in a level III NICU (Utah)	Standardized perineal skin-care guideline + EMR prompts + switch to preservative-free WaterWipes	Incidence and duration (days/100 patient-days) of any and severe diaper dermatitis; fungal infection signal (topical nystatin)	Any DD 45.5%→38.0%; severe DD 22.6%→14.6%; severe-DD days 6.1→2.6/100 pt-days; no increase in fungal infections

Reference	Design	Population	Intervention	Outcome	Results
Santos S et al. (2021)	Methodological content-validation study	Five neonatal-expert nurses from different Brazilian regions (2 professors, 2 stomatherapists, 1 staff nurse)	Experts rated 298 proposed nursing interventions (15 domains, 55 items) then 39 revised/new interventions in a second round, using CAI ≥80% and CVI ≥0.8 for clarity and relevance	Committee Agreement Index (CAI) and Content Validity Index (CVI) for each intervention; number of interventions reaching validity criteria	First round: 298 interventions, 8 (2.7%) below CAI/CVI thresholds. Second round: 39 interventions evaluated; all achieved required CAI/CVI, yielding a final set of 310 validated nursing interventions to prevent skin lesions in hospitalized newborns
Gustin J et al. (2021)	Blinded randomized crossover study	95 infants >7 days–≤8 weeks (<6.4 kg) randomized; 80 completed both regimens and were analyzed	Regimen A: emollient, apertured diaper + acidic pH-buffered wipe. Regimen B: non-emollient, non-apertured diaper + wipe with limited buffering	Skin pH (chest, perianal, genital) and blinded erythema scores in diaper area	Regimen A lowered diaper-area pH to near chest values and produced more infants with no/slight perianal erythema plus ~50% fewer severe erythema events than Regimen B ($p<.05$)
Schachner LA et al. (2022)	Expert consensus	Eight pediatric dermatology experts; no patient cohort (evidence from 57 publications)	Structured literature search (2010–2020) and virtual consensus meeting to draft and grade statements on ceramide skincare	Set of consensus statements on infant skin barrier, ceramides, and cleanser/moisturizer recommendations	Five statements agreed: infant barrier is immature; ceramides are key SC lipids; early moisturization is important in AD; ceramide products support barrier homeostasis; mildly acidic, fragrance/sensitizer-free cleansers and ceramide moisturizers from birth help maintain/protect the barrier
Karakoç IB et al. (2022)	RCT	90 term and preterm neonates (≥32 weeks, ≥1500 g), admitted to NICU within 24 h; 30 SSO, 30 liquid Vaseline (LV), 30 control	All: standardized cleansing. SSO group: sunflower seed oil to body (except scalp/face/diaper area) once daily ×16 days. LV group: liquid	Neonatal Skin Condition Score (dryness, erythema, breakdown) at baseline and every 48 h (9 assessments);	From the 3rd assessment onward, NSCS significantly lower (better) in SSO and LV vs control; by assessments 8–9 SSO < LV < control ($P<.001$); control scores unchanged (median 5.0); no skin

			Vaseline similarly. Control: no moisturizer	observation for skin infection/irritation	infections, dryness, or peeling in any group
Boyar V (2022)	Single-center retrospective case series	15 pediatric patients (7 neonates, 4 other infants, 4 older children) with moisture-, friction-, or trauma-related skin damage	1–3 applications of cyanoacrylate skin protectant (Marathon) to affected areas, with/without adjunct dressings	Clinical healing/drying, device/dressing retention, granulation tissue, pain, adverse reactions	Lesions dried and re-epithelialized, peristomal wear time improved, granulation tissue decreased, skin tears stabilized; pain low and no adverse skin reactions reported
Schachner LA et al. (2023)	Consensus statement	Panel of 8 pediatric dermatology experts; no original patient cohort (evidence from >70 publications)	Structured literature search (2010–2021) and panel discussions to develop a newborn/infant skincare algorithm	Final algorithm and simple clinical scale (scaling/xerosis, erythema, erosion/oozing) with tiered skincare recommendations	Consensus that brief lukewarm baths, mildly acidic (pH 4–6), fragrance-/sensitizer-free cleansers and regular barrier-lipid (incl. ceramide) moisturizers from birth help maintain the skin barrier and may mitigate infant atopic dermatitis

Reference	Design	Population	Intervention	Outcome	Results
Jani P et al. (2023)	International survey	848 NICUs worldwide caring for extremely preterm infants (<28 weeks' GA)	None; questionnaire on frequency of specific skin injuries and detailed skincare practices	Unit-reported frequency of skin injuries and adjusted odds of injuries by skincare practices (guidelines, assessment frequency, emollient/adhesive use, etc.)	Common injuries: diaper dermatitis 39%, MARSI 38%, perineal 26%, abrasion 24%, pressure injuries 22%, infection 11%; local skincare guidelines and ≥4-hourly skin assessments were associated with lower odds of several injuries, whereas petrolatum-based emollients were associated with higher odds of diaper/perineal injuries; marked regional/income-group practice variation
Gözen D et al. (2023)	RCT	80 healthy term newborns (≥37 weeks, ≥2500 g), 24+ h old, Istanbul Medipol University Hospital (40 control, 40 experimental)	All infants received a standardized tub bath at 24 h. Control: liquid petroleum jelly moisturizer applied immediately postbath. Experimental: same moisturizer applied 10 min postbath	Whole-body skin moisture and body temperature measured prebath, immediately postbath, and at 10, 20, 40, 60 min postbath	Skin moisture rose in both groups in the first 10 min, but at 60 min was higher with delayed application (34.42% vs 31.71%; p = .027), with moisture in controls falling below prebath values by 40–60 min; body temperature increased slightly after bathing and was better maintained over 60 min in the delayed group
Allaway R et al. (2024)	Best Practice Statement	Paediatric patients (neonates, children, adolescents) with acute and chronic wounds (e.g., trauma, burns, surgical wounds, medical device–related injury, pressure ulcers, MASD/IAD, epidermolysis bullosa)	Comprehensive paediatric wound management approach: structured wound assessment, pain/anxiety management, prevention of MARSI, appropriate cleansing/debridement, tailored dressing selection, prevention/management	Improved wound healing and skin integrity; reduction of pain and distress; prevention of complications (MARSI, MASD, pressure injury); safer, age-appropriate wound care	No quantitative effectiveness data reported (non-comparative guidance document). Provides practical recommendations and clinical principles to support paediatric wound care decision-making

			of MASD and pressure injury		
Tiryaki Ö et al. (2024)	RCT	66 preterm infants, 34–37 weeks' gestation, ≥2000 g, NICU stay ≥7 days, Turkey; equally allocated to sunflower seed oil (SSO), coconut oil, or control (no oil)	Twice-daily whole-body (except face/scalp) oil massage from 24 h after birth to discharge + parent-applied twice-daily at home to 1 month: SSO group: 5 mL/kg/day sunflower seed oil. Coconut group: 5 mL/kg/day coconut oil. Control: routine care, no oil	Weight at NICU admission, discharge, and 1 month post discharge; skin condition by Neonatal Skin Condition Score (NSCS) and Revised Northampton Neonatal Skin Assessment Tool (NNSAT) at same time points	At 1 month, SSO and coconut groups weighed more than controls (≈3.30–3.38 kg vs 3.01 kg; p=.004) and had better NSCS scores (3.05 vs 3.41; p=.002); NNSAT risk scores improved over time in all groups, with lower discharge risk in the SSO group vs control
Rehbinder EM et al. (2024)	Exploratory sub-study	2,153 Scandinavian infants (995 intervention, 1,158 no intervention); FLG genotype in 1,683	From 2 weeks to 8 months: paraffinum-liquidum bath oil ≥4×/week + daily facial cream vs usual care	TEWL at 3, 6, 12 months; presence of dry skin; modification by FLG loss-of-function mutations	Intervention group had slightly higher mean TEWL (Δ+0.42 g/m²/h; mainly at 3 months: 8.6 vs 7.6) but less dry skin at 3 and 6 months (51% vs 59%; 53% vs 63%); no TEWL/dry-skin difference at 12 months. FLG carriers showed higher TEWL in both groups, without significant interaction

Reference	Design	Population	Intervention	Outcome	Results
Burns R et al. (2024)	Quality-improvement project	Level III NICU, Midwest USA; 118 eligible RNs caring for VLBW/ELBW infants <1500 g	Nurse education on premature skin + implementation of an evidence-based skincare bundle embedded in the EHR (<1500 g / <1000 g bundle options)	RN education completion; proportion of eligible infant-days with bundle documented (yes/no per shift) days 1–30 vs 31–60	Education completed by 81% of RNs; bundle use increased from 65.8% (156/237 shifts) to 80.8% (354/438), a significant improvement, leading to adoption of the bundle as standard practice and spread to all network NICUs
Ozyurt N et al. (2024)	RCT	55 PICU nurses in a Turkish children's hospital (27 experimental, 28 control)	Stop Pediatric Pressure Injury (SPPI) Short Intervention training (three-module PI course) vs no training	Nurse PI-knowledge score (50-item SPPI test); patient PPI prevalence and stages; Braden Q and PUSH scores	Training significantly increased knowledge scores; in experimental nurses' patients PPI prevalence fell from 10.6% to 5.3% while rising 5.3%→7.2% in controls, severe and device-related PPIs decreased, and Braden Q/PUSH scores improved vs controls
Topçuoglu Arslan İZ et al. (2025)	Comparative semi-experimental / quasi-experimental study	120 term neonates, 37–42 weeks' GA, 0–72 h old, expected NICU stay ≥5 days, Istanbul state hospital (60 almond, 60 EVOO)	≈10 mL almond oil or EVOO applied once daily during morning care to whole body except head for 5 consecutive days; NSCS and hand hydration measured before and 3 h after each application	Hand stratum corneum hydration (digital moisture meter) and Neonatal Skin Condition Score; observation of adverse skin effects	Both oils significantly increased skin hydration and improved NSCS over 5 days; EVOO produced higher hydration than almond oil on days 1–3 (p=.024, .004, .020), NSCS did not differ between groups, and no adverse skin reactions occurred
Yuguchi A et al. (2025)	Prospective cohort study	Mothers of term infants in Japan: 2019 control n=132, 2020 intervention n=140	Control: usual frequent bathing/gauze washing. Intervention: gentler hand-washing with foaming soap + thorough rinse and once-daily full-body moisturizer from birth	TEWL (forehead, shin) at 2–5 days; skin-care practices; AD incidence at 6 and 12 months	Forehead TEWL lowers with intervention; overall AD at 6/12 months similar, but winter-born infants had markedly less AD at 12 months (21.2%→2.9%) in the intervention year