



OPINION ARTICLE

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Role of Textiles in Paediatrics

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Textiles in paediatrics are essential for protection, comfort, and, increasingly, health monitoring, acting as a functional barrier for sensitive skin and a tool for medical management. Specialized textiles manage dermatitis through antimicrobial silver properties, while breathable materials like organic cotton and bamboo support delicate skin health. Advanced textiles are also transforming to wearables that monitor heart rates in children, reducing the burden of clinical visits.

Key Roles of Textiles in Pediatrics Include

Skin Health and Comfort: Because children's skin is roughly 30% more sensitive than adult skin, choosing the right fabrics like soft, breathable, and hypoallergenic materials is crucial to reducing allergic reactions and managing conditions like eczema.

Antimicrobial Protection: Specialized textiles, often incorporating silver, are used to prevent dust mite sensitization and control bacterial infections, providing a protective, hygienic barrier.

Smart Monitoring: Textile-based, wearable technologies are now being utilized to monitor vital signs like heart rates and electrocardiograms (ECGs) in children, offering a non-invasive way for continuous monitoring at home.

Safety and Hygiene in Healthcare: In clinical settings, medical textiles provide sterility and safety, reducing the risk of healthcare-associated infections through high-performance clothing and bedding.

Sensory Comfort and Psychological Wellbeing: Softness and comfort are prioritized to meet the needs of a child's active, dynamic lifestyle, including specialized sleepwear and everyday clothing that enhance comfort.

However, the industry faces challenges in mitigating the presence of harmful chemicals, such as surfactants, flame retardants, and phthalates, which can leach from textiles. Sustainable, natural, and non-toxic materials are increasingly preferred to ensure safety.

Textiles in paediatrics go beyond simple clothing, serving critical roles in clinical therapy, physiological development, and advanced medical monitoring. Because children have thinner, more permeable skin and immature thermoregulation, textiles act as a "secondary protective barrier" rather than just an aesthetic layer.

Clinical and Therapeutic Roles

Advanced "medical textiles" are integrated into standard paediatric care to manage specific conditions.

Atopic Dermatitis (AD) Management: Specialized fabrics, such as Microair Derasilk (transpiring woven silk), are used to reduce bacterial colonization and skin irritation in children with eczema.

Antimicrobial Protection: Fabrics treated with silver, copper, or zinc oxide help lower the risk of healthcare-associated infections (HAIs) and inhibit the growth of pathogens like Staphylococcus.

Wound Care: Textiles are used in advanced dressings, bandages, and scaffolds to accelerate healing and provide pressure distribution for venous conditions.

Hypoallergenic Barriers: Natural fibers like organic cotton and bamboo are preferred to minimize exposure to harsh pesticides and synthetic dyes that trigger contact dermatitis.

Specialized Care for Neonates

For premature infants, textiles are engineered to compensate for physiological immaturity.

Thermoregulation: Multilayer textile assemblies (e.g., combining cotton with polyurethane membranes) are designed for sleeping bags and caps to retain body heat and moisture, preventing hypothermia in neonates who lack subcutaneous fat.

Incubator Accessories: Specialized bio-nonwoven fabrics are used for eye swaths and diapers within incubators to protect delicate organs while maintaining a sterile environment.

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Sensing and Monitoring: "Smart textiles" with integrated conductive sensors allow for non-invasive, continuous monitoring of vital signs like heart rate, respiration, and temperature without the discomfort of bulky wires.

Developmental and Functional Roles

Textiles actively influence a child's sensory and motor growth

Sensory Development: Varied textures (smooth silk vs. ribbed cotton) provide tactile stimulation essential for brain connection and cognitive growth.

Motor Skill Growth: Soft, stretchy fabrics (like jersey knits) encourage active play and movement (crawling, walking). Features like buttons and zippers help develop fine motor skills.

Cognitive and Emotional Impact: Colors and high-contrast patterns (e.g., black and white) stimulate visual tracking in infants. For older children, choosing their own clothing helps develop identity and self-expression.

Comparison of Common Pediatric Textile Fibres

Fibre Type	Key Role in Pediatrics	Primary Advantage
Organic Cotton	Standard wear/ Undergarments	Hypoallergenic; breathable; chemical-free
Bamboo	Sensitive skin / NICU	Naturally antibacterial; superior moisture-wicking
Silk (Medicated)	Atopic Dermatitis therapy	Reduces itching; non-irritating; antimicrobial
Linen	Summer/Active wear	Highly breathable; heat-regulating
Merino Wool	Winter/Insulation	Naturally flame-retardant; keeps dry while warm