The Adoption of Sustainable Textiles & Smart Apparel Technology for the South African Healthcare Sector

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Abstract

The development of sustainable textiles and smart apparel technology represents a crucial advancement for the healthcare sector in South Africa, providing innovative solutions to improve patient monitoring and overall healthcare delivery. This research explores the integration of sustainable textile fibers and intelligent apparel technologies, comprising embedded sensors and data analytics, that enable real-time health monitoring to improve the overall treatment of patients. Smart textiles have already begun to revolutionize patient care in the global health care systems—enabling continuous monitoring of patient's heart rate, temperature, and blood pressure while digitally transferring medication to patients. This improves patient treatment and reduces hospital readmissions. South Africa's healthcare sector faces unique challenges, including resource constraints and a high burden of disease. By using sustainable textiles and smart apparel technology, South African manufacturers can address these challenges while promoting environmental sustainability through waste reduction and decreased reliance on harmful chemicals that are typically utilized in traditional textile manufacturing.

The study aims to highlight the significance of integrating sustainable practices into the textile supply chain, highlighting the potential for job creation and economic expansion in a sector critical to the national economy. Additionally, it will examine the importance of collaborative initiatives among stakeholders—such as government entities, healthcare providers, including textile and apparel manufacturers, which promotes an environment that fosters innovation in sustainable smart textiles and apparel technology. By utilizing local resources and skills, South Africa can establish itself as a pioneer in the global South region for the creation of environmentally sustainable healthcare solutions that correspond with global sustainability trends and the sustainable development goals. This study will comprise a mixed method approach comprising of surveys, focus group interviews and case healthcare professionals, patients, and textile manufacturers to gather in-depth insights into their experiences, expectations, and concerns.

The study emphasizes that using sustainable smart textiles in healthcare improves patient care through enhanced monitoring capabilities while fostering a circular economy using biodegradable fibers and minimizing textile waste. The global healthcare sector is increasingly acknowledging the advantages of smart textiles for personalized medicine, and South Africa can leverage this technology to enhance its healthcare services while tackling urgent environmental issues. In conclusion, the adoption of sustainable smart textiles in the South African healthcare sector provides multiple advantages that enhance patient outcomes via improved monitoring, increased comfort, reduced hospital visits, customised medical solutions, environmental sustainability, and integration with existing healthcare technologies. These innovations can improve individual patient health and improve the overall efficiency and efficacy of the healthcare system in South Africa.

Keywords

Sustainable textiles, smart apparel technology, healthcare innovation, South Africa.