



3D Printing in Orthopedics: Implementing Custom Implants in Rural Mozambique's Healthcare Settings

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Abstract

Orthopedic implants are essential for treating bone fractures and joint diseases in rural healthcare settings where resources may be limited. A pilot study was conducted with local surgeons and engineers using off-the-shelf 3D printers. Custom implants were designed based on CT scans of patients' bone structures. The custom implants showed a success rate of 95% in terms of fit and function, reducing the need for costly imports from abroad. This study demonstrated that 3D printing can be effectively used to produce affordable orthopedic implants tailored to local patient needs. Further studies should explore scalability and long-term efficacy before full-scale implementation in other hospitals. Orthopedics, Custom Implants, 3D Printing, Rural Healthcare Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African Geography, Orthopedic Surgery, 3D Printing, Custom Implants, Rural Healthcare, Surgical Technique, Medical Technology*

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