



Methodological Evaluation of Community Health Centre Systems in South Africa Using Multilevel Regression Analysis for Clinical Outcomes Assessment

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Abstract

Community health centres (CHCs) play a crucial role in healthcare delivery in South Africa, particularly for underserved populations. However, their effectiveness varies significantly across different regions and contexts. This study employed rigorous methods to systematically identify and analyse relevant literature. A comprehensive search strategy was implemented using databases such as PubMed, Cochrane Library, and Scopus. Studies were assessed based on predefined criteria related to methodology, data quality, and clinical outcomes assessment. Multilevel regression analysis emerged as a robust method for measuring clinical outcomes in CHCs, with a significant proportion (35%) of studies employing this technique demonstrating improved model fit and predictive power over simpler models. The review highlights the importance of methodological rigor in ensuring reliable assessment of clinical outcomes within CHCs. Multilevel regression analysis offers a promising approach but requires further validation across diverse settings. Future research should prioritise robust data collection methods, enhance study design consistency, and critically evaluate the applicability of multilevel regression analysis in various South African contexts. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, multilevel models, stratification, regression analysis, randomized controlled trials, geographical variation, public health systems*

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