2014

Evaluating the Implementation of a Drone-Delivered Blood Product System for Postpartum Haemorrhage in Remote Oromia, Ethiopia: A Mixed Methods Study

M, e, k, d, e, s, A, b, e, b, e, ,, T, s, e, g, a, y, e, B, e, k, e, l, e

DOI: https://doi.org/10.5281/zenodo.PENDING_2416

Abstract

Postpartum haemorrhage (PPH) remains a leading cause of maternal mortality in Ethiopia. Access to timely blood transfusion is a critical challenge in remote areas, creating a need for innovative delivery solutions. This mixed methods study evaluated the implementation of a drone-delivered blood product system for PPH in remote health centres of the Oromia region, Ethiopia. Its objectives were to assess the acceptability, feasibility, and fidelity of the system and to identify barriers and facilitators to its integration into routine emergency obstetric care. A convergent parallel mixed methods design was used. Quantitative data on drone delivery metrics, such as response times and success rates, were extracted from health facility records. Concurrently, qualitative data were collected through in-depth interviews and focus group discussions with healthcare workers, programme staff, and community representatives. Quantitative data were analysed descriptively, and qualitative data underwent thematic analysis. The system demonstrated high feasibility, with 94% of requested drone flights successfully completing delivery. The median drone transport time was 47 minutes, compared to a median of 4 hours for previous ground transport. Qualitative findings revealed strong acceptability among health workers, who reported increased confidence in managing PPH. Key implementation barriers included logistical disruptions during the rainy season and initial community apprehensions. The drone-delivered blood

system was a feasible and acceptable intervention that substantially reduced transport times for essential blood products. Successful implementation depended on consistent technical support, proactive community engagement, and effective integration with existing emergency referral systems. To support scale-up and sustainability, recommendations include: investing in all-weather drone technology and supportive infrastructure; providing ongoing training and mentorship for health centre staff; and developing integrated national guidelines for drone-assisted emergency supply chains. postpartum haemorrhage, drone logistics, blood transfusion, implementation science, mixed methods, remote health services, Ethiopia. This study provides empirical evidence on the implementation of drone technology for emergency obstetric care in a low-resource setting, offering practical insights for policymakers and programme managers aiming to strengthen remote healthcare delivery.