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**Karolinska
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Makerere University**

Integrated Community Case Management of Malaria and Pneumonia in Eastern Uganda: Care-seeking, Adherence, and Community Health Worker Performance

Academic Thesis

The public defence for the degree of Doctor of Philosophy at Karolinska Institutet and Makerere University will be held at Makerere University College of Health Sciences, Davies Lecture Theatre, Kampala, Uganda

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by

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Abstract

Background: Despite being easily preventable and treatable, malaria and pneumonia are major killers of children aged less than five years. Integrated community based interventions through which lay persons called community health workers (CHWs) can manage malaria, pneumonia, diarrhea and neonatal conditions are recommended by WHO and UNICEF. However, there is limited information on care-seeking and performance of CHWs in the context of integrated illness management.

Main aim: To assess care-seeking and quality of care in integrated community case management of malaria and pneumonia in children aged less than five years in Uganda so as to inform the implementation of integrated community case management of childhood illness strategy (ICCM).

Methods: Four studies (I-IV) were nested in a cluster randomized trial in Iganga-Mayuge demographic surveillance site in eastern Uganda. In this trial CHWs treated malaria and pneumonia (intervention arm) or malaria alone (control arm) in children aged 4-59 months. Performance of CHWs (I) was assessed using: questionnaires (with knowledge tests, case scenarios) and record reviews for 125 CHWs; observations among 57 CHWs in the intervention arm; and four focus group discussions with CHWs. Adherence to treatment was assessed using pill counts and caregiver reports among 1256 children treated by CHWs (II). Receipt of prompt and appropriate antibiotics for pneumonia symptoms and treatment outcomes were assessed among 1276 children treated by CHWs (III). Care-seeking and management of malaria and pneumonia were assessed among 1095 children and from 13 key informant interviews (IV).

Results: Care-seeking from CHWs was higher in the intervention than the control arm (31% vs 22%, $p=0.01$) (IV). CHWs' performance on malaria symptoms was similar in the intervention and control arms on: overall knowledge, eliciting signs and symptoms, and prescribing (I). More children treated by CHWs received prompt and appropriate malaria treatment compared to other health providers (37% vs 9%, $p<0.001$) (IV). CHWs had high scores in prescribing for pneumonia but had lower: overall knowledge of pneumonia (40%), and scores on eliciting pneumonia signs and symptoms (25%). Only 35% of CHWs counted respiratory rates within two breaths of rates counted by the physician, and 12% of children without fast breathing received antibiotics while 82% with fast breathing received antibiotics (I). Children treated by CHWs in the intervention arm were more likely to receive prompt and appropriate antibiotics for pneumonia symptoms compared to the control arm (RR=3.51, 95% CI = 1.75-7.03) (III). There was also a higher reduction in the proportion of children with fast breathing from day one to day four in the intervention compared to the control arm (9.2% vs 4.2%, $p=0.01$); and a lower proportion of febrile children on day four (1% vs 4%; RR=0.29, 95% CI = 0.11-0.78) (III). Adherence to combined antimalarials and antibiotics was similar to adherence to antimalarials alone in the intervention arm (mean 99% both groups) (II).

Conclusions: CHWs' performance on malaria was not affected by additional roles of pneumonia management, but they had challenges in assessment of pneumonia symptoms. CHWs should be supported with continued training, adequate supervision and provision of drugs, diagnostics and other supplies.

Key words: malaria, pneumonia, community health worker, community case management, Uganda

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