

COVID perceptions among pregnant women living in a malaria hyperendemic rural region in Uganda: a cross-sectional study

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Background

In 2020, the WHO reported an **increase in the estimated number of global malaria cases**, reaching 247 million cases from the 230 million reported in 2015. The rise that occurred in 2020 has been largely attributed to the disruption of malaria control strategies caused by COVID19.

Both SARS-CoV2 and *Plasmodium falciparum* infection during pregnancy increases the risk for **adverse maternal and foetal outcomes**, including abortion, intrauterine growth retardation, maternal anaemia, severe disease and death. In Uganda, the the country with the third highest burden of malaria cases worldwide, maternal mortality is 336 maternal deaths every 100,000 live births.

Although malaria and COVID-19 show an overlapping clinical presentation, they require a profoundly different approach. The aim of this study was to explore COVID-19 awareness among pregnant women living in a *P. falciparum* hyperendemic region in rural Uganda.

Methods

Study design. Community-level, cross-sectional, prospective survey.

Study period. 14th July, 2022, to 14th March, 2023.

Study setting. The study was conducted in St. John XXIII Hospital of Aber, Atipe Health Centre III and Aboke Health Centre IV, Oyam district, Lango region, Uganda.

Study population. All pregnant women presenting to antenatal care visits were eligible for recruitment.

Study procedures. Data about demographics, COVID-19 history and COVID-19 and malaria perceptions were collected by structured questionnaires using RedCap mobile app platform.

Study endpoint. Endpoint of the study was a context-specific COVID-19 knowledge score developed with local community leaders.

Statistical analysis. Association between study variables and good COVID-19 knowledge was assessed by chi-square and t-test, as appropriate, and variables found to be statistically significant were further explored in multivariate logistic regression analysis.

Results

A total of 888 pregnant women were recruited, 719 (81%) in Aber Hospital, 97 (10.9%) in Aboke HC and 72 (8.1%) in Atipe HC. Median age was 24 (IQR 20-29) years. 92% of the women were vaccinated against COVID-19.

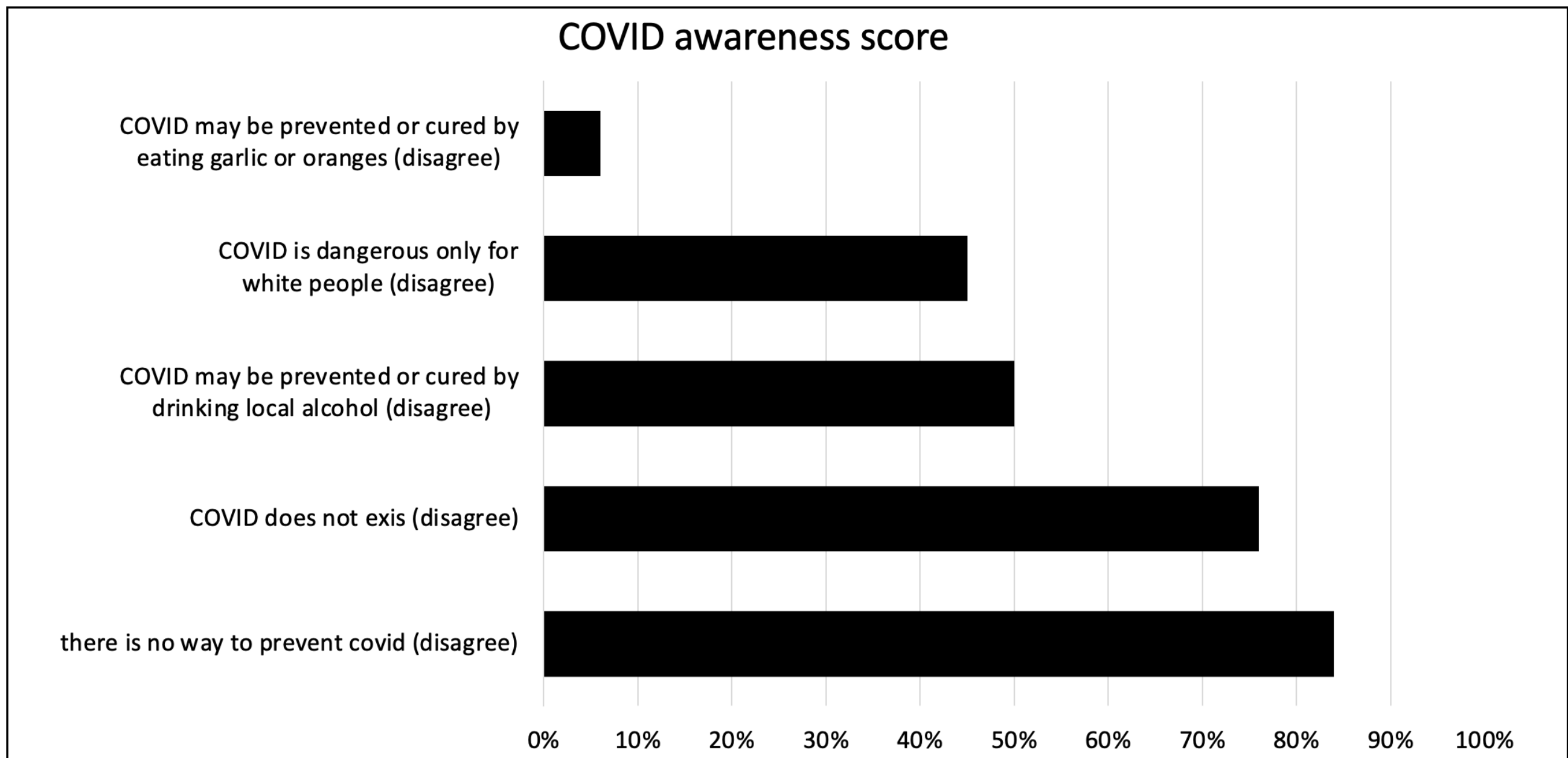


Figure 1. COVID knowledge questionnaire response distribution

	Overall (N=888)	Low COVID knowledge (N=715)	Good COVID knowledge (N=173)	P-value ^a
Marital status				0.879
DIVORCED	10 (1.1%)	8 (1.1%)	2 (1.2%)	
MARRIED	830 (93.5%)	667 (93.3%)	163 (94.2%)	
NEVER MARRIED	48 (5.4%)	40 (5.6%)	8 (4.6%)	0.723
Ever diagnosed with COVID-19	4 (0.5%)	4 (0.6%)	0 (0%)	
Received vaccination against COVID-19	817 (92.0%)	663 (92.7%)	154 (89.0%)	0.128
Vaccine doses	817 (92%)			0.138
More than two doses	119 (13.4%)	89 (12.4%)	30 (17.3%)	
Two	353 (39.8%)	293 (41.0%)	60 (34.7%)	
One dose	345 (38.9%)	281 (39.3%)	64 (37.0%)	
Missing	71 (8.0%)	52 (7.3%)	19 (11.0%)	
Belief that COVID is more dangerous than malaria	593 (66.8%)	491 (68.7%)	102 (59.0%)	-
Good knowledge about malaria	316 (35.6%)	236 (33.0%)	80 (46.2%)	0.0015

Table 1. Univariate analysis

	aOR (95%CI)	95%CI low	95%CI high	p.value
Age	1.00	0.972	1.038	0.75
Presentig at Aboke HC IV for ANC visit	3.22	0.622	20.667	0.19
Presenting at Atipe HC III for ANC visit	8.179	4.146	16.484	<0.001
Highest level of education that you attained: upper secondary	3.052	1.359	6.708	0.006
Occupation: farming	0.828	0.414	1.718	0.603
Occupation: unemployed	0.821	0.369	1.854	0.632
Occupation: tailor	0.519	0.194	1.316	0.176
Received COVID vaccination	0.471	0.262	0.874	1.38
Good knowledge about malaria	1.761	1.211	2.56	0.003

Table 2. Multivariable logistic regression model

	Overall (N=888)	Low COVID knowledge (N=715)	Good COVID knowledge (N=173)	P-value ^a
Age at enrollment				0.57
Median [Q1, Q3]	24.0 [20.0, 29.0]	24.0 [20.0, 29.0]	25.0 [21.0, 29.0]	
Missing	2 (0.2%)	2 (0.3%)	0 (0%)	
Health Centre				<0.001
Aber	719 (81.0%)	604 (84.5%)	115 (66.5%)	
Aboke	97 (10.9%)	78 (10.9%)	19 (11%)	
Atipe	72 (8.1%)	33 (4.6%)	39 (22.5%)	<0.001
Educational level				
Lower primary	462 (52.0%)	399 (55.8%)	63 (36.4%)	
Upper primary	242 (27.3%)	179 (25.0%)	63 (36.4%)	
Lower secondary	82 (9.2%)	67 (9.4%)	15 (8.7%)	
Upper secondary	40 (4.5%)	25 (3.5%)	15 (8.7%)	
Tertiary	42 (4.7%)	31 (4.3%)	11 (6.4%)	<0.001
No education	20 (2.3%)	14 (2.0%)	6 (3.5%)	
Occupation				
Employed	77 (8.7%)	57 (8.0%)	20 (11.6%)	
Farming	591 (66.6%)	493 (69.0%)	98 (56.6%)	
Housewife	153 (17.2%)	107 (15.0%)	46 (26.6%)	
Tailor	67 (7.5%)	58 (8.1%)	9 (5.2%)	

Conclusions

Among pregnant women living in rural Uganda, high COVID-19 awareness relies on: 1. The overall educational level; 2. Active educational interventions; 3. Good malaria knowledge. Among pregnant women living in P. falciparum endemic areas, good community-level malaria awareness might serve as a predictor for preparedness to future pandemics and emerging infectious diseases