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Enhancing the uptake of antenatal care, skilled delivery, and post-natal care services among nomadic pastoralist pregnant women in Kenya using beaded Global Position System (GPS) bracelets

Submission date
26/05/2024

Recruitment status
No longer recruiting

Registration date
07/10/2024

Overall study status
Completed

Last Edited
12/05/2025

Condition category
Pregnancy and Childbirth

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol
Background and study aims
Maternal and child health has been a concern and priority for the global community as articulated in SDG number 3.4 and equally articulated in Kenya's Big Four agenda. Kenya continues to have a high maternal death rate, despite the commitment from the government to address the issue. Most maternal deaths are preventable as the healthcare solutions to prevent or manage complications are well known. All women need access to antenatal care during pregnancy, skilled care during childbirth, and postnatal care after childbirth. To provide adequate care during pregnancy, the antenatal profile needs to be conducted for all pregnant mothers. However, as a result of adverse climatic change which has made the pastoralist community more mobile and thus negatively affecting the pastoralists in northern Kenya, expectant women are unable to access antenatal care, skill delivery, and postnatal care services as per national and international standards. This is also because the provided facilities are static, ill-equipped, and out of reach, coupled with high illiteracy levels among the pastoralist community and more so the women. This study will involve collecting data about the impact of GPS tracking on maternal and neonatal health. The findings could inform policies and interventions to improve care delivery in pastoralist communities. Therefore, this study is an attempt to assess the effectiveness of Global Position System (GPS) bracelets in improving the uptake of antenatal care, health facility delivery, and postnatal care services among mobile /pastoralist communities in Kenya.

Who can participate?
Pastoralist pregnant women over 18 years old who are less than 16 weeks pregnant

What does the study involve?
Participants are randomly allocated to a group that receives GPS tracking during antenatal and postnatal care or a control group that does not. By comparing outcomes between the two

groups, the researchers can determine whether GPS tracking improves care utilization, health outcomes or other relevant factors.

What are the possible benefits and risks of participating?
Occasionally one or more of the following potential side effects of taking blood samples may occur: pain, bruising, and slight bleeding. A trained technician will be drawing the blood. The treatment or procedure may involve risks that are currently unforeseeable. There are no known risks or discomforts from the stool and urine collection technique. GPS magnetic fields at these levels do not cause harmful effects.
The study provides health benefits to participants by identifying any condition or infection that might complicate the pregnancy and delivery outcome. The health benefits are doing laboratory tests like HIV, hemoglobin level, presence of any sexually transmitted infection, urinary tract infection, presence of malaria parasites, blood grouping, and any intestinal parasites. By doing all this the participants can benefit from preventing transmission of HIV from mother to child, anemia, and hemolytic diseases in newborns.

Where is the study run from?
1. African Academy of Sciences (Kenya)
2. University of Pécs (Hungary)

When is the study starting and how long is it expected to run for?
September 2021 to September 2024

Who is funding the study?
This research was supported by Grand Challenge Africa (Grant Nr. GCA 011/114) and the National Research, Development and Innovation Fund of Hungary (NKFI FK-147404, ÚNKP-23-4-II-PTE-2061, TKP-2021-EGA-10). Project No. RRF-2.3.1-21-2022-00012, titled National Laboratory on Human Reproduction, has been implemented with the support provided by the Recovery and Resilience Facility of the European Union within the framework of Programme Széchenyi Plan Plus, and this project has received funding from the HUN-REN Hungarian Research Network.

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Study information

Scientific Title
Evaluating the effectiveness of global position system (GPS) bracelets to improve the uptake of antenatal care, health facility delivery, and post-natal care services among mobile/pastoralist communities in Kenya

Study objectives

This study aims to determine the effectiveness of Global Positioning System (GPS) beaded bracelets on the utilization of antenatal, health facility delivery, and postnatal care among pastoralist pregnant women

1. Null hypothesis: There is no difference in the utilization of antenatal care, health facility delivery, and postnatal care among pastoralist pregnant women tracked by using beaded Global Positioning System bracelets
2. Alternative hypothesis: There is a difference in the utilization of antenatal care, health facility delivery, and postnatal care among pastoralist pregnant women tracked by using beaded Global Positioning System bracelets

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 08/11/2021, Amref Ethics and Scientific Review Committee (ESRC) (PO Box 30125-00100, Nairobi, -, Kenya; +254 (0)20 688 4000; esrc.kenya@amref.org), ref: AMREF - ESRC P1062 /2021

Primary study design
Interventional

Study design
Unmasked randomized controlled trial

Study type(s)
Efficacy

Health condition(s) or problem(s) studied
Enhancing the uptake of maternal and child health services in pastoralist pregnant women

Interventions
Participants were randomly chosen through computer-generated numbers and allocated into two groups (with beaded GPS bracelets and without). Participants were not masked because the wearable GPS was visible to others.

The devices (GPS) were dressed with beads to entice participants to wear them at all times. Participants were given the devices upon determination of eligibility and consent to participate, and they were instructed to keep them throughout the pregnancy.

The medical team conducts a health outreach program that provides antenatal care, skilled delivery, and postnatal care. Women with GPS are tracked and their location is identified and service given. Women without GPS are not tracked but follow the normal outreach program process (If they come, service is given but if they don’t come no follow-up is done).

Duration of Intervention and follow-up: 6 months during pregnancy and 9 months after delivery (15 months). GPS devices are given to women and then they are followed up from 12 weeks of pregnancy up to the delivery and 9 months after a successful birth of a baby for immunization.

Intervention Type
Device

Phase
Phase I

Drug/device/biological/vaccine name(s)
Beaded Global Positioning System bracelets

Primary outcome(s)
1. Attendance of more than four ANC visits, received skilled/health facility delivery, and received postnatal care among the intervention and control participants, collected using a questionnaire at the end of pregnancy for ANC uptake, skilled delivery for those who will deliver at hospital and uptake of first postnatal care after delivery.
2. Maternal death and infant death:
2.1. Maternal death: death whether it's during pregnancy, childbirth, or within 42 days of termination of pregnancy within the pastoralist community throughout the intervention
2.2. Infant death: the number of newborns in a pastoralist community understudy dying under 1 year of age divided by the number of resident live births for the same geographic area. This will be done at the end of the intervention.

Key secondary outcome(s)
1. Demographic factors: age, level of education, literacy level, socioeconomic status, marital status, polygamous or monogamous marital status. This was collected using a standard questionnaire at the beginning of the study
2. Geographic context: nomadic lifestyle, distance from health facility, remoteness, and cultural practices. This was collected using a standard questionnaire throughout the study
3. Media exposure and awareness: radio with local FM, TV, and community health campaigns. This was collected using a standard questionnaire at the beginning of the study
4. Quality of care of ANC and delivery services given at health facilities. Some of the factors contributing to quality service to clients e.g. respectful care, waiting times, and provider competence will be considered. This was collected using a standard questionnaire throughout the study.

Completion date
10/09/2024

Eligibility

Key inclusion criteria
1. Pastoralist pregnant women
2. >18 years old
3. <16 weeks pregnant
4. Able to understand study procedures and to comply with them for the entire length of the study
5. Consented to wear beaded GPS bracelets
6. Consented to have laboratory procedures conducted to complete the profile
7. Consents to screening and enrollment interviews
8. If successful delivery, consent to have the baby evaluated and vaccinated

Participant type(s)
Other

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Upper age limit
49 Years

Sex
Female

Total final enrolment
105

Key exclusion criteria
1. Pregnancy >12 weeks gestation
2. No consent
3. Women with a previous history of complicated pregnancy
4. Age <18 years
5. Physical disability
6. Women who do not deliver or if they abort
7. If the child dies

Date of first enrolment
29/11/2021

Date of final enrolment
27/12/2021

Locations

Countries of recruitment
Kenya

Study participating centre
Marsabit county
57-60700
Moyale Sub County
Kenya
60700

Sponsor information

Organisation
African Academy of Sciences

ROR
https://ror.org/05px9k635

Organisation
University of Pecs

ROR
https://ror.org/037b5pv06

Funder(s)

Funder type
Government

Funder Name
Pécsi Tudományegyetem

Alternative Name(s)
Universität Pécs, University of Pécs, PTE

Funding Body Type
Government organisation

Funding Body Subtype
Local government

Location
Hungary

Funder Name
Grand Challenge Africa

Funder Name
National Research, Development and Innovation Fund of Hungary

Funder Name
Recovery and Resilience Facility of the European Union within the framework of Programme Széchenyi Plan Plus

Funder Name
HUN-REN Hungarian Research Network

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analyzed during the current study will be available upon request from Dahabo Adi Galgalo (adi.dahabo@yahoo.com)

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		08/05/2025	12/05/2025	Yes	No