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Feasibility of using mobile phone AI-assisted dietary assessment and nudging to improve diets in female youth aged 18-24 years in urban Ghana

Submission date
02/02/2023

Recruitment status
No longer recruiting

Registration date
08/02/2023

Overall study status
Completed

Last Edited
08/02/2023

Condition category
Other

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Unhealthy diets are a critical global concern while dietary measurement methods are time-consuming and expensive. There is limited evidence that phone-based interventions can improve nutrition data collection as well as dietary quality, especially for youth and adolescents in low and middle income countries. We developed an artificial-intelligence-based phone application called Food Recognition Assistance and Nudging Insights (FRANI) to tackle these problems. The objectives of this study are to measure the acceptability, adherence, and likeability of FRANI, as well as its effects on the food choices of female youth in Accra, Ghana.

Who can participate?
Female youth aged 18-24 years

What does the study involve?
In each setting, we randomly allocate participants into two groups: The intervention group with the full version of FRANI including the gamified nudges to encourage healthier food choices. The control group will receive FRANI without the gamified nudges. Both groups will have their food choices tracked for 8 weeks.

What are the possible benefits and risks of participating?
Evidence generated from this study will assess the potential for new technology to improve scalable data collection in nutrition, and healthier food choices for a population at risk of malnutrition.
No risks are involved.

Where is the study run from?
International Food Policy Research Institute (IFPRI) (USA)

When is the study starting and how long is it expected to run for?
September 2022 to April 2023

Who is funding the study?
Consortium of International Agricultural Research Centers (CGIAR) (France)

Who is the main contact?
Dr Aulo Gelli, a.gelli@cgiar.org

Contact information

Type(s)
Principal investigator

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
Nil known

Study information

Scientific Title
Assessing the feasibility of using innovative AI mobile technology that provides real-time diagnostics and tailored "nudging" on dietary intake as a strategy to improve diets of female students aged 18-24 years at the University of Ghana

Acronym
FRANI

Study objectives
The FRANI mobile app is designed to improve diets by increasing the consumption of healthy foods and beverages, whilst crowding out the consumption of unhealthy foods.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 20/11/2022, International Food Policy Research Institute (IFPRI) ethics board (1201 Eye Street NW, Washington DC, USA; +1 2028125611; IFPRI-IRB@cgiar.org), ref: #00007490

Study design
Randomized controlled pilot study

Primary study design
Interventional

Study type(s)
Other

Health condition(s) or problem(s) studied
Improving the quality of diets in women 18-24 years

Interventions
The intervention group with the full version of FRANI including the gamified nudges to encourage healthier food choices. The control group will receive FRANI without the gamified nudges. Participants in both groups will have their food choices tracked for 8 weeks.
The intervention group will be able to take pictures of their meals, set dietary goals, and will receive personalized medals and badges according to the dietary quality of the foods they ate. They will be able to see the scores and statistics about the quality of their diet. They will receive a daily report summarizing everything they ate and notifications reminding them to take pictures. In contrast, the participants in the control group will have access to a mobile phone with a limited version of FRANI, without possibility of setting dietary goals, nor a home screen, daily reports, scores and statistics. They also will not receive medals and badges. Both groups will see the same notifications, except daily report reminders for the control group.
A computer-generated sequence will be used to randomly allocate participants to the intervention and control groups at a 1:1 ratio for each country separately.

Intervention Type
Behavioural

Primary outcome(s)
The feasibility of the FRANI will be assessed by measuring outcomes related to adherence and acceptability:
1. Adherence is defined as the number of days the participants completed dietary recalls on the FRANI divided by the total number of days of the pilot test. Participants will be considered adherent if this is equal to 70% or higher, starting to count from the first and ending on the last day of the pilot.
2. Acceptability summarizes likeability, satisfaction, intent to use, and intent to continue using the FRANI, while usability summarizes what affects the use of the FRANI.
Acceptability and usability are measured according to answers from structured questionnaires. If

participants grade the acceptability or usability of the FRANI as 30 or more points in their respective structured questionnaires, the app will be considered accepted or usable.

Key secondary outcome(s))
Measured using data captured by FRANI over the entire duration of the pilot:
1. Percentage of total meals recorded in FRANI
2. Quality of dietary choices measured using the Individual Dietary Diversity Score
3. Quality of dietary choices measured using the EAT-Lancet Diet Score
4. Quality of dietary choices measured using the Global Diet Quality Score (GDQS)

Completion date
30/04/2023

Eligibility

Key inclusion criteria
Female youth aged 18-24 years living in the targeted communities.

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Upper age limit
24 years

Sex
Female

Key exclusion criteria
Participant not providing consent.

Date of first enrolment
03/02/2023

Date of final enrolment
15/02/2023

Locations

Countries of recruitment
Ghana

Study participating centre
Noguchi Memorial Institute for Medical Research, University of Ghana
S Legon Dr
Accra
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LG 581

Sponsor information

Organisation
International Food Policy Research Institute

ROR
https://ror.org/03pxz9p87

Funder(s)

Funder type
Research organisation

Funder Name
Consortium of International Agricultural Research Centers

Alternative Name(s)
CGIAR

Funding Body Type
Private sector organisation

Funding Body Subtype
Other non-profit organizations

Location
France

Results and Publications

Individual participant data (IPD) sharing plan
The data will be shared on the IFPRI dataverse 1 year after the completion of the study
https://dataverse.harvard.edu/dataverse/IFPRI

IPD sharing plan summary

Stored in publicly available repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes