Company
Ausnutria

Case Title
Interactive app for maternal and offspring health.

Participants
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Problem description
Ausnutria B.V. is a professional dairy company that produces infant formula. A prime mission of Ausnutria is to improve the health of both mother and child. The perinatal period (i.e. the period during and after pregnancy) is key for later life health, for both mother and child. A well-known example is gestational diabetes that increases the risk of later-life maternal and offspring type II diabetes. Early detection of risk factors or health issues would help to treat and possibly reverse. Validated questionnaires have been developed to detect and monitor health outcomes such as growth, comfort, happiness, cognition and so on. These questionnaires can be used in clinical or observational studies, but are often long and burdensome for the participants to complete. In addition, self-reported questionnaires have their downsides with regard to bias in recall, incomplete administrations, misreporting, or socially desirable answers.

Alternative measurements that are more objective, reliable, non-invasive, fast, and less cumbersome are desirable to overcome high drop-outs rates and unreliable data in clinical studies. Innovative non-invasive alternatives can be provided by making use of smartphone applications. Most apps for pregnant women and new mothers are either preventive or informative. However, there are only a few apps that collect data for monitoring purposes using smartphone properties. Therefore, we would like to explore the option to develop an app that is attractive to potential participants in the way that the measurements are user-friendly, fun, less cumbersome but are still valid and reliable for use in research targeting both pregnant, mothers, and infants. Target outcomes of interest of Ausnutria are amongst others, health, growth, comfort, happiness and cognition.

Approach
The goal of this project is to develop an interactive app to monitor the health of women during and after pregnancy and the health and development of infants (0-3 years). Smartphones could be used to collect data on health, growth, and (cognitive) development, commonly known as mHealth. These measurements can be taken with current build-in smartphone sensors, such as the camera, microphone and so on.
**Promising solution(s)**
Recently innovative measurements using smartphones have been developed or are under development. The overview of these innovative measurements will help Ausnutria to develop an interactive app to monitor health. A comprehensive overview of measurements that could be made with current built-in smartphone sensors such as the camera, microphone, accelerator etc has been compiled. Out of the box ideas are applied to tailor these measurements to make them specific for our target population. All the measurable parameters are mentioned in the full summary (confidential). In addition, to prevent drop-out from the study the app has to be fun, rewarding, and user-friendly. A very important reward for participants is to get reliable direct feedback when using the app. Therefore, several innovative ideas that will keep the users attracted to the app for the duration of the research have been proposed.

**Conclusion and future prospects**
Available smartphones have several built-in sensors that make it possible to do many different measurements related to health, growth, and child development. However, many of these are new developments and need further study before valid measurements can be taken. Most measurements are not automatic and require user input. An existing platform made by Apple, Researchkit, can be used for app development within the framework of a clinical study.

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